

The material in this manual is subject to change without notice. Despite every effort, in a manual of this scope, errors or omissions may occur. TOSHIBA cannot be held responsible for any malfunctions or loss of data as a result.

Owner's Manual Part #: PAD8210-1

Ver. 1

(C) 1982 Toshiba Corporation



## TABLE OF CONTENTS

	<u>Page</u>
<b>INTRODUCTION</b>	i
<b>PART 1: SETTING UP YOUR COMPUTER</b>	1- 1
Overview Of Part 1	1- 3
Prepare Work Area	1- 5
Environmental Requirements	1- 5
Gather Tools	1- 7
Open Cartons	1- 7
Install Components	1- 9
CPU/Keyboard	1- 9
Display	1-11
Floppy Disk Drive Unit	1-13
Printer	1-17
RS-232C Communications	1-19
RAM And ROM PACK	1-21
Plug In Power Cables To Wall Outlets	1-23
<b>PART 2: OPERATING YOUR COMPUTER</b>	2- 1
Overview Of Part 2	2- 3
Understanding The Components	2- 5
Taking Care Of The Disks	2- 7
Turning On The Power	2- 9
Turn On The Display	2-11
Turn On The Floppy Disk Drive Unit	2-13
Insert A Floppy Disk	2-13
Turn On The CPU/Keyboard Power	2-15
Replies To The Initial Screen Requests	
T-DISK BASIC	2-17
T-BASIC	2-19
Using The Cursor	2-21
Adjusting The Display Screen	2-21
Adjusting The Display Tilt/Swivel	2-23
Write-Protecting Floppy Disks	2-27
Setting Up New T-DISK BASIC Disks (Formatting)	2-28
Copying T-DISK BASIC Disks	2-31
Setting Up New CP/M Disks (Formatting)	2-34
Copying CP/M Disks	2-36

	<u>Page</u>
Using The Keyboard	2-39
Data Keys	2-39
Line Editing Keys	2-41
Special Function Keys	2-45
Programmable Function Keys	2-47
Correcting Typing Mistakes	2-49
Overstriking	2-49
Deleting	2-49
Inserting	2-50
Removing The Disks	2-53
Labeling Floppy Disks	2-55
Turning Off The Power	2-57
<b>PART 3: TROUBLE-SHOOTING</b>	3- 1
Overview Of Part 3	3- 3
Trouble-Shooting Guide	3- 5
<b>PART 4: COMPUTER LANGUAGE INTRODUCTION</b>	4- 1
Overview Of Part 4	4- 3
Running A Short BASIC Program	4- 4
To Change A Line	4- 4
To Add A Line	4- 5
To Remove A Line	4- 5
To Check The Program	4- 5
To Execute The Program	4- 6
More Sample Programs	4- 7

## APPENDICES

A. NOTES ON CARE, MAINTENANCE, SERVICE POLICY	A- 1
B. USING A CASSETTE	A- 8
C. T-BASIC AND T-DISK BASIC CONTROL CHARACTER TABLE	A- 9
D. USING TELECOMMUNICATIONS	A-11
E. HARDWARE SPECIFICATIONS	A-12
F. PART NUMBERS	A-15

## GLOSSARY

## INDEX

## LIST OF FIGURES

<u>Figure</u>		<u>Page</u>
1.1	Display	1- 2
1.2	CPU/Keyboard	1- 2
1.3	Disk Unit	1- 2
1.4	RS-232C	1- 2
1.5	Printer	1- 2
1.6	RAM/ROM PACK	1- 2
1.7	T100 Work Area	1- 4
1.8	Open Cartons	1- 6
1.9	The Back Of The CPU	1- 8
1.10	CPU/Keyboard Power Off	1- 8
1.11	Plug Into CPU "AC IN"	1- 8
1.12	Display Power Off	1-10
1.13	Plug Into Display	1-10
1.14	Plug Into CPU "COLOR" Or "B/W"	1-10
1.15	Open Disk Drive Doors	1-12
1.16	Remove Magnetic Head Protectors	1-12
1.17	FDD Power Off	1-12
1.18	Plug Into CPU "EXT. BUS"	1-14
1.19	Plug Into FDD	1-14
1.20	Plug Into FDD Unit "AC IN"	1-14
1.21	Plug Into CPU "PRINTER"	1-16
1.22	Plug Into CPU "RS-232C"	1-18
1.23	Open CPU RAM/ROM Cover	1-20
1.24	Insert RAM And/Or ROM PACK	1-20

## List of Figures (Continued)

<u>Figure</u>		<u>Page</u>
2.1	T100 Components	2- 4
2.2	Turn On Display Power	2-10
2.3	Turn On FDD Unit Power	2-12
2.4	Open Disk Drive Door	2-12
2.5	Insert Disk	2-12
2.6	Close Disk Drive Door	2-12
2.7	Turn On CPU Power	2-14
2.8	The Cursor	2-20
2.9	Display Brightness	2-20
2.10	Display Tilt/Swivel	2-22
2.11	Disk Write-Protection Slot	2-26
2.12	Keyboard	2-38
2.13	Line Editing Keys	2-40
2.14	Special Function Keys	2-44
2.15	Graphics	2-44
2.16	Programmable Function Keys	2-46
2.17	Remove Disk	2-52
2.18	Disk Labels	2-54
2.19	Turn Off CPU Power	2-56
2.20	Turn Off FDD Unit Power	2-56
2.21	Turn Off Display Power	2-56

## **INTRODUCTION**

Congratulations on your acquisition of the TOSHIBA T100 Personal Computer! Your TOSHIBA T100 Personal Computer is powerful and easy to use. In addition, TOSHIBA's hundred years in business and worldwide reputation for high quality and reliability stand behind your T100. The T100 components include:

### *Central Processing Unit and Keyboard:*

- 89 keys
- Graphics
- 10-key pad for numbers
- Programmable function keys
- 64K byte main memory RAM; 32K byte ROM for BASIC language; 16K byte video RAM standard
- 32K byte optional ROM PACK
- Audio response capability—four octaves of tones
- CENTRONICS printer interface
- RS-232C serial interface

### *Disk Storage:*

- Two 5½ inch floppy disk drives with 560 KB of storage
- Dual-density, double-sided disk

### *Fine Color Display:*

- 8 colors: red, blue, green, yellow, purple, light blue, white and black
- Human engineered—tilts and swivels for convenience
- High quality resolution: 640 X 200 dots

### *Monochrome (Green) Display:*

- Varying shades
- Human engineered—tilts and swivels for convenience
- High quality resolution: 640 X 200 dots

TOSHIBA offers a wide range of printers for numerous applications ranging from word processing to program development.

A programming language called T-BASIC (for TOSHIBA BASIC) is available in ROM when you turn on your CPU. If you have a floppy disk drive unit, you receive a system disk with an extension to T-BASIC called T-DISK BASIC. With a floppy disk drive, you may also use a CP/M system disk produced by Digital Research to perform a wide variety of jobs. CP/M based software is available from TOSHIBA to do word processing, analyze productivity and perform other business functions.

*TOSHIBA provides an RS-232C interface to allow your T100 to communicate with a variety of other computers.*

*Learning to use your T100 is easy. Just follow these simple steps and the instructions in this manual.*

*STEP 1: Unpack and install your equipment. SEE PART 1 OF THIS OWNER'S MANUAL.*

*STEP 2: Learn to operate the various components. SEE PART 2.*

*STEP 3: Consult, if necessary, the "Trouble-Shooting" section. SEE PART 3.*

*STEP 4: Learn about programming on the T100. SEE PART 4.*

*The instructions in this manual apply only to the installation and operation of TOSHIBA T100 units. This manual is written to explain every step as carefully as possible. If you are an experienced computer user, you may only need to scan parts of the material.*

*Appendices offer additional information:*

*Appendix A Care and maintenance of your T100, as well as very important facts about the T100 service policy.*

*Appendix B Instructions for those who wish to use a cassette for storage.*

*Appendix C List of control characters.*

*Appendix D Information on using telecommunications.*

*Appendix E Data on hardware specifications.*

*Appendix F Parts listing.*

#### *AFTER THIS MANUAL:*

*Consult the Programmer's Reference Manual to learn about the language commands, statements and functions. If you are using the CP/M disk, consult the Programmer's Reference Manual for a synopsis of CP/M use.*

*T-BASIC<sup>©</sup> and T-DISK BASIC<sup>©</sup> — COPYRIGHT<sup>©</sup> by Microsoft 1982, all rights reserved. CP/M<sup>®</sup> is a Registered Trademark of Digital Research, Inc.*

## PART 1

### SETTING UP YOUR COMPUTER

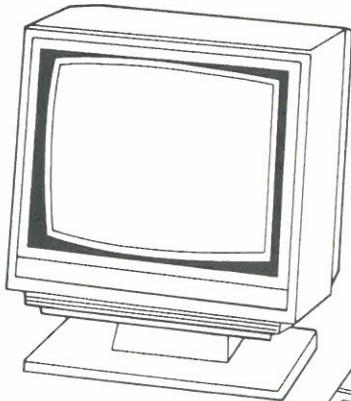


Figure 1.1 Display

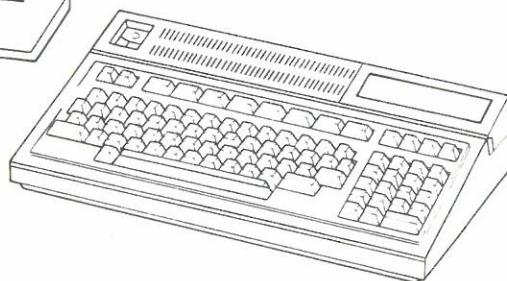


Figure 1.2 CPU/Keyboard

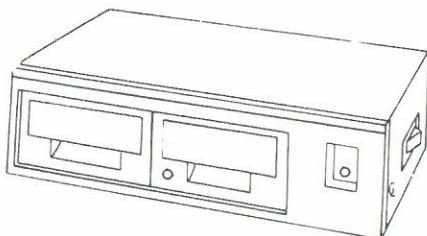


Figure 1.3 Floppy Disk Drive Unit

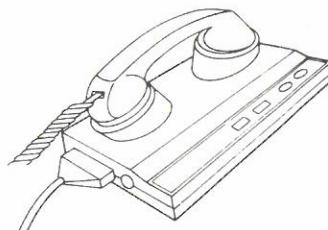


Figure 1.4 Plug Into CPU  
"RS-232C"

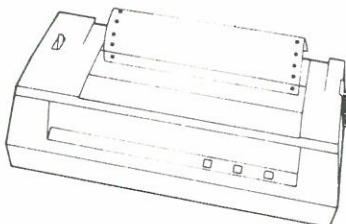


Figure 1.5 Printer



Figure 1.6 RAM/ROM PACK

## OVERVIEW OF PART 1

Part 1 focuses on the installation of the various components available for your T100 Personal Computer. The components are presented at left:

- CPU/Keyboard
- Display
- Floppy Disk Drive Unit
- Printer
- RAM/ROM PACKS
- RS-232C Communications

Throughout this manual, wherever possible, **illustrations and charts are placed on the left** pages, while **text is placed on the right** pages. Therefore, always begin by reading the right page, and refer to the left page as appropriate.

1

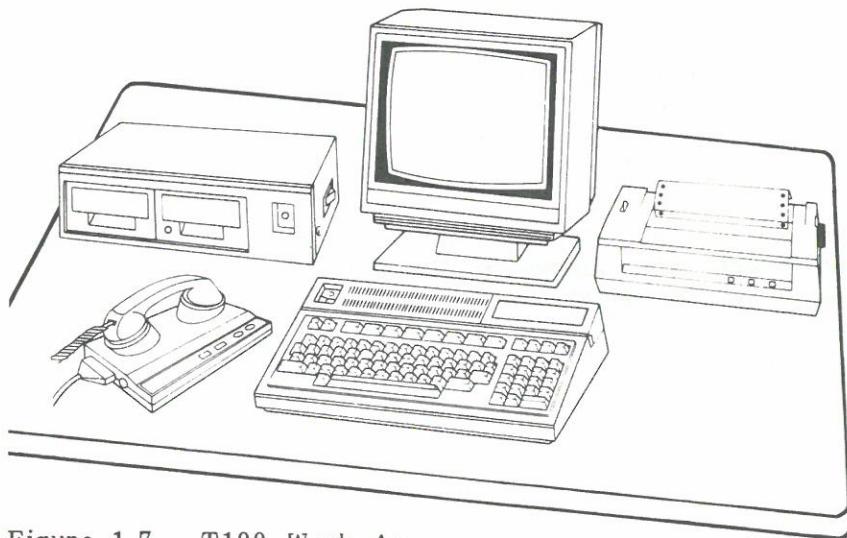


Figure 1.7 T100 Work Area

## PREPARE WORK AREA

1. Decide on the best work area. You will need a hard, clean, level work surface that is sturdy enough to hold your computer and at a convenient height for typing. (Do not place the units on carpet.) The length of the cables requires that you have some units very close to each other. You will also need to place all units at least 4 inches away from the wall. One possible placement is shown at left.

### Environmental Requirements

When you operate your system, the room should be clean and dry. Avoid severe humidity and temperature changes. The ambient temperature and relative humidity ranges should be:

Temperature	5°C - 35°C
Relative humidity	20% - 80%

The system, including its cables, must be set up in a place which is free or at least distant from:

- o Dust, moisture, dampness and direct exposure to sunlight. These could create a fire hazard or equipment malfunction.
- o Objects which radiate heat. These could cause cabinet damage and other problems.
- o Objects which radiate strong electromagnetic waves, such as microwave ovens.
- o Corrosive chemicals or liquids.
- o Radios or televisions, unless the television is in use with your T100. Interference can occur in these units and/or the computer.

Keep the area around the ventilation holes of each unit clear. Keep the top of the equipment clear. Avoid violent shocks or vibrations to the equipment while it is in use or in storage. The equipment should be completely assembled during use. If it is partially dismantled, it may cause accidents or electric shock. Also be sure to store it completely disassembled.

2 Gather Tools

3 Open Cartons

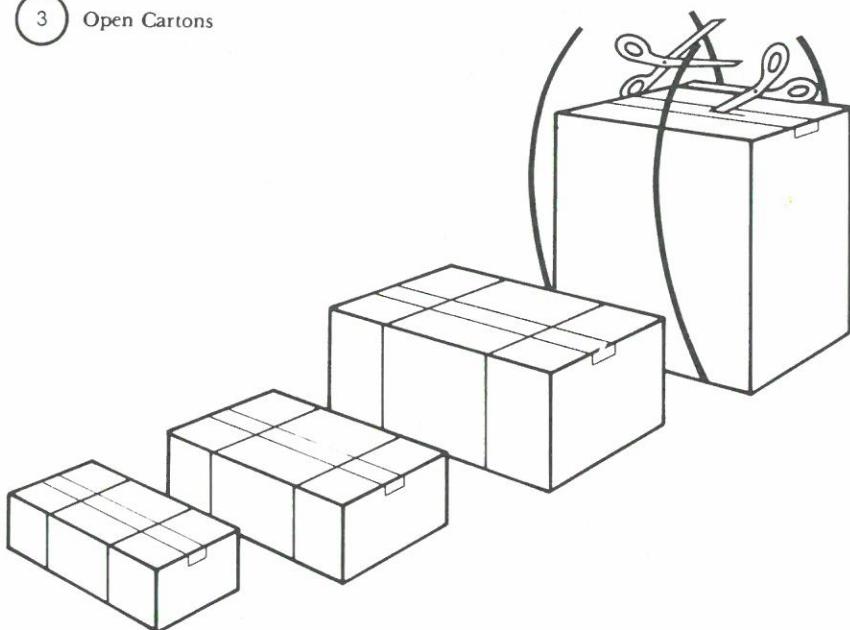


Figure 1.8 Cartons

## GATHER TOOLS

2. Gather together the tools you will need:

- o Scissors
- o Flathead screwdriver (if you have a disk drive)

## OPEN CARTONS

YOU SHOULD HAVE OPENED THE CPU BOX AND REMOVED THIS MANUAL.

3. Now open all of the boxes, as shown at left. Be very careful as you cut the tape to open a box that you do not cut through to the equipment.

IT IS RECOMMENDED THAT YOU SAVE ALL BOXES AND PACKING MATERIALS IN CASE YOU NEED TO MOVE YOUR EQUIPMENT.

4e

4d

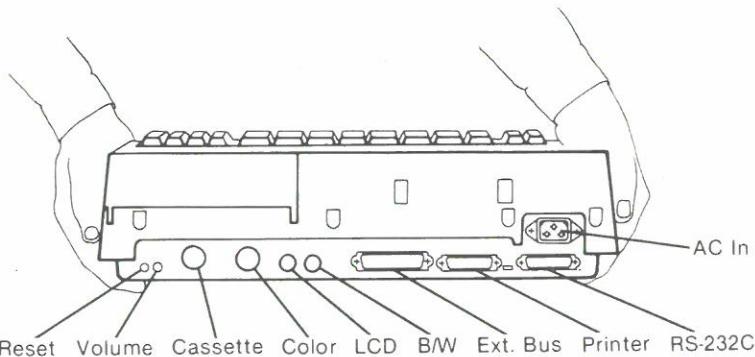


Figure 1.9 The Back Of The CPU

4e

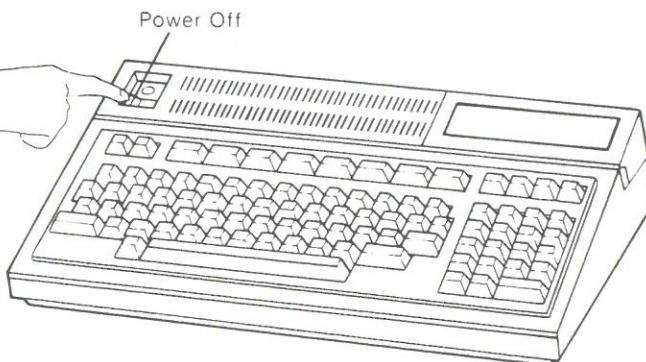


Figure 1.10 CPU/Keyboard Power Off

4f

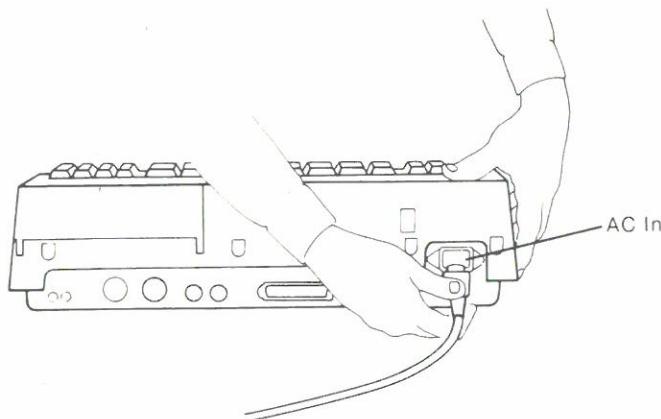


Figure 1.11 Plug Into CPU "AC IN"

## INSTALL COMPONENTS

As you install your units, be sure that all of the cords and connecting cables are freely movable instead of placed under other equipment or furniture. DO NOT PLUG ANY COMPONENT OUTLETS INTO A WALL SOCKET UNTIL ALL OF YOUR COMPONENTS ARE INSTALLED.

### CPU/KEYBOARD

4. You should unpack the CPU/Keyboard box first.
  - a. Remove the cable(s) from the inner packing box.
  - b. Lift out the CPU/Keyboard unit with the styrofoam packing in place.
  - c. Remove the styrofoam sleeves and the plastic covering from the CPU/keyboard.
  - d. Look at the component connectors with labels on the back of the CPU.
  - e. Make sure the CPU/keyboard power switch is OFF.
  - f. Plug the power cable into the connector labeled "AC IN" on the back of the CPU.

WARNING: IT IS EXTREMELY IMPORTANT THAT YOU PLUG ALL CABLES INTO THE CORRECT CONNECTIONS, OR YOU MAY DAMAGE YOUR EQUIPMENT.

5d

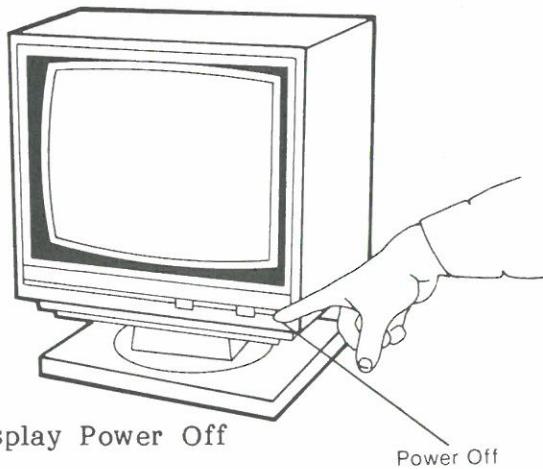


Figure 1.12 Display Power Off

Power Off

5e

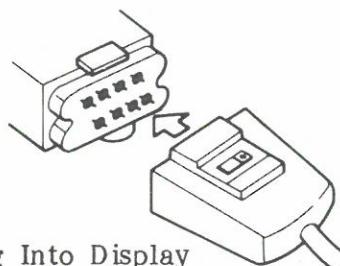


Figure 1.13 Plug Into Display

5f

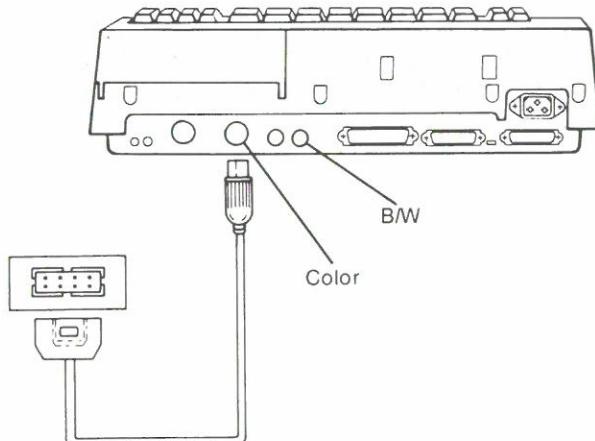


Figure 1.14 Plug Into CPU "COLOR" Or "B/W"

## DISPLAY

5. If you have a color or monochrome display, open that next.
  - a. Lift out the video display unit with the packing fabric still around it.
  - b. Remove the packing fabric. Remove the styrofoam collar from around the base of the display.
  - c. Remove the cable from the back of the display. Squeeze together and pull out the plastic cord guard to release the cord.
  - d. Make sure the display power switch is OFF.
  - e. Press the lock and plug the rectangular metal connector into the back right of the TOSHIBA T100 display.
  - f. The round end of the connector plugs into the back of the CPU. The connection is different for color and monochrome:

FOR COLOR: Plug the cable into the socket labeled "COLOR."

FOR MONOCHROME: Plug the cable into the socket labeled "B/W."

If you have a monochrome and a color display, they may both be connected to the CPU at the same time.

6d

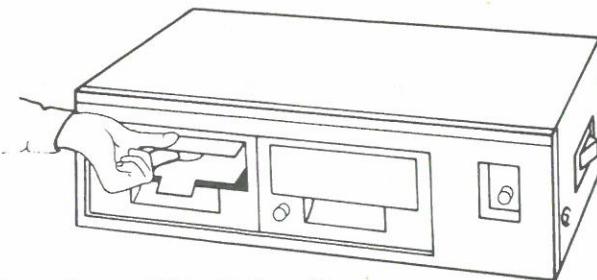


Figure 1.15 Open Disk Drive Doors

6e

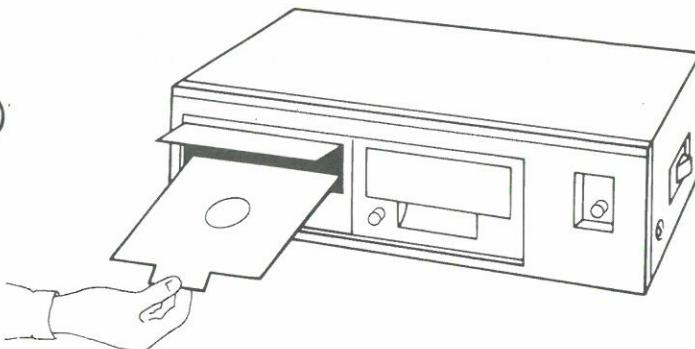


Figure 1.16 Remove Magnetic Head Protectors

6f

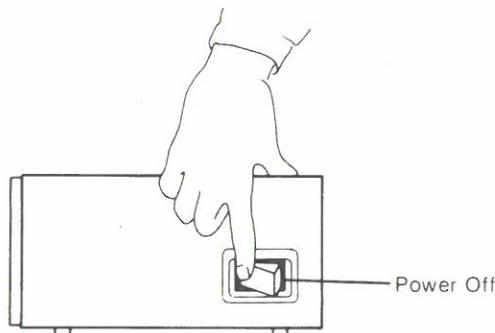


Figure 1.17 FDD Power Off

## FLOPPY DISK DRIVE UNIT

6. If you have a floppy disk drive unit (FDD), open that next.
  - a. Remove the inner packing box. Remove the two cables from the inner packing box.
  - b. Lift out the FDD unit.
  - c. Remove the styrofoam sleeves and the plastic covering.
  - d. Lift both disk drive doors.
  - e. Remove the cardboard magnetic head protectors from the disk drives and close the drive doors. (Be sure to save these and the packing material in case the FDD must be transported in the future.)
  - f. Make sure that the power switch on the FDD unit is OFF.

CONTINUED ON THE NEXT TWO PAGES

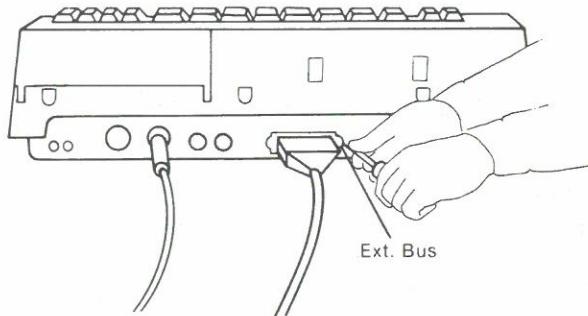


Figure 1.18 Plug Into CPU "EXT. BUS"

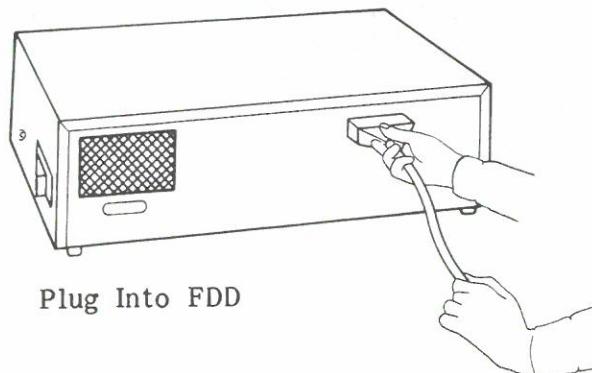


Figure 1.19 Plug Into FDD

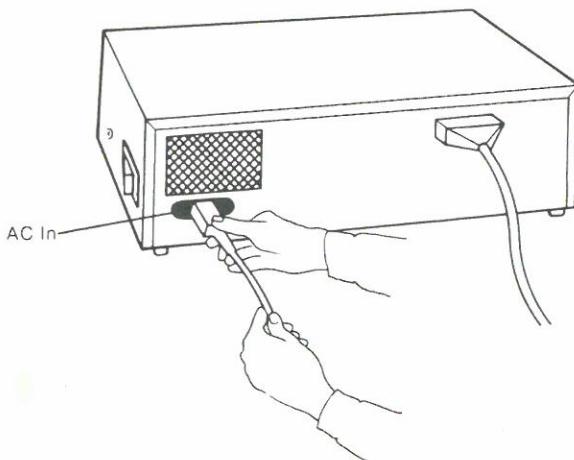


Figure 1.20 Plug Into FDD "AC IN"

## Floppy Disk Drive Unit (Continued)

- g. Plug either end of the wide-end cable into the connection on the back of the CPU labeled "EXT. BUS."
- h. Tighten the cable connector screws with a small screwdriver.
- i. Plug the other end of the cable into the back of the disk drive and tighten the screws.
- j. Plug the second cable into the connection on the back of the disk drive labeled "AC IN."

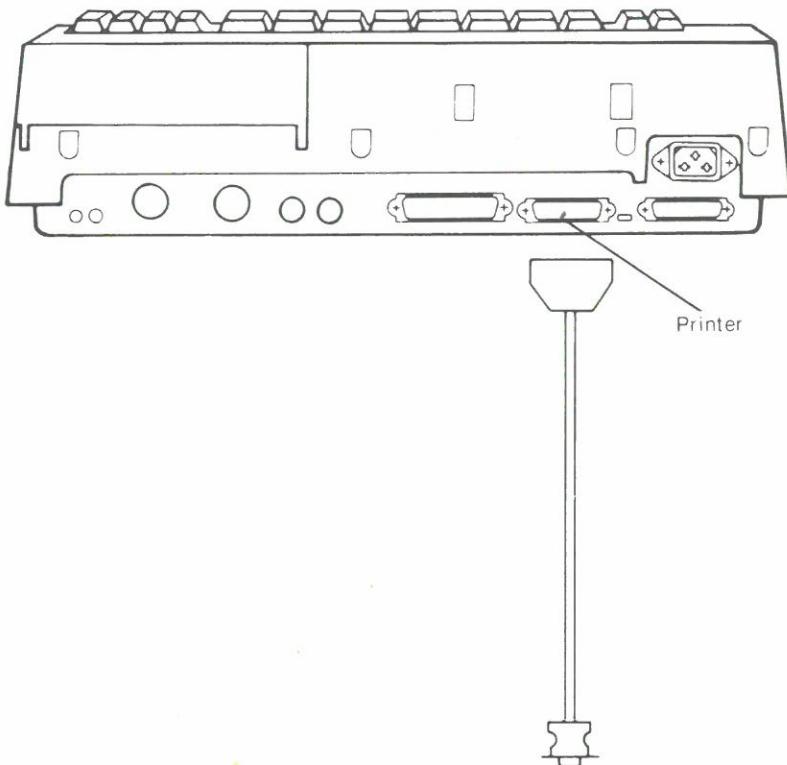


Figure 1.21 Plug Into CPU "PRINTER"

## PRINTER

### 7. If you have a printer, open that next.

Follow the instructions for installation of the printer which is described in the manual provided with your printer. You will need to obtain a printer cable specifically designed for attaching a printer to the T100 from your TOSHIBA dealer.

To connect the printer to your T100 CPU, plug one end of the TOSHIBA printer cable into the connection labeled "PRINTER" on the back of the CPU. This is the CENTRONICS interface. Tighten the two screws with a screwdriver.

Your TOSHIBA dealer can recommend the printer best suited to your needs.

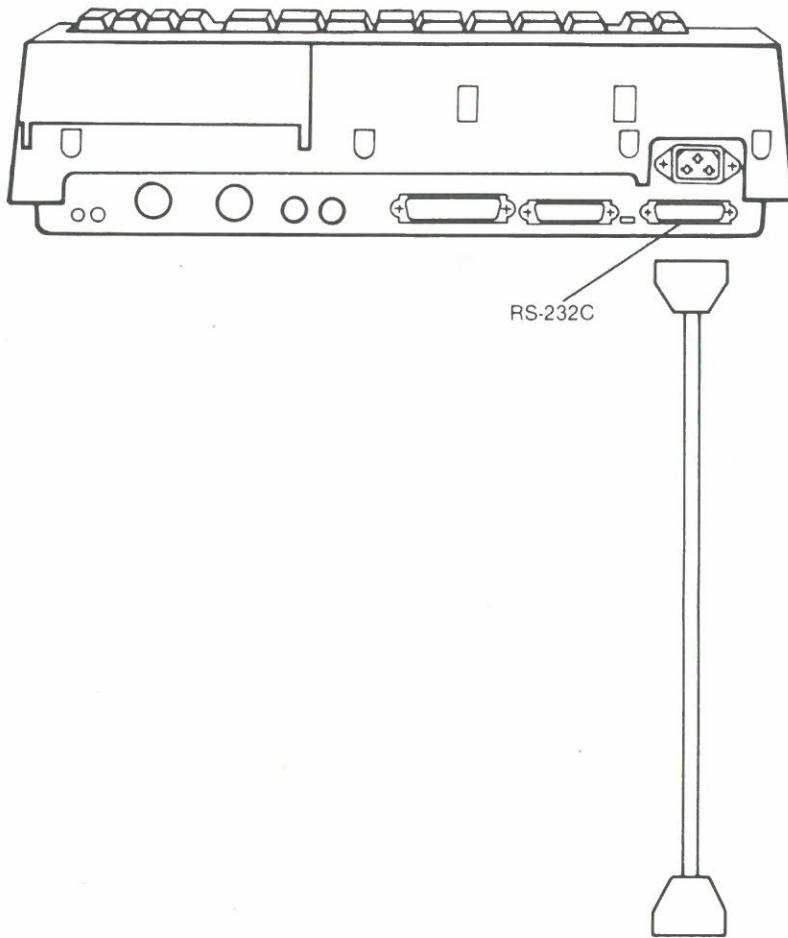


Figure 1.22 Plug Into CPU "RS-232C"

## RS-232C COMMUNICATIONS

8. If you wish to use RS-232C communications, obtain the RS-232C cable from your TOSHIBA dealer.

Plug one end of the TOSHIBA cable into the connection labeled "RS-232C" on the back of the CPU and the other into the RS-232C communications device.

9b

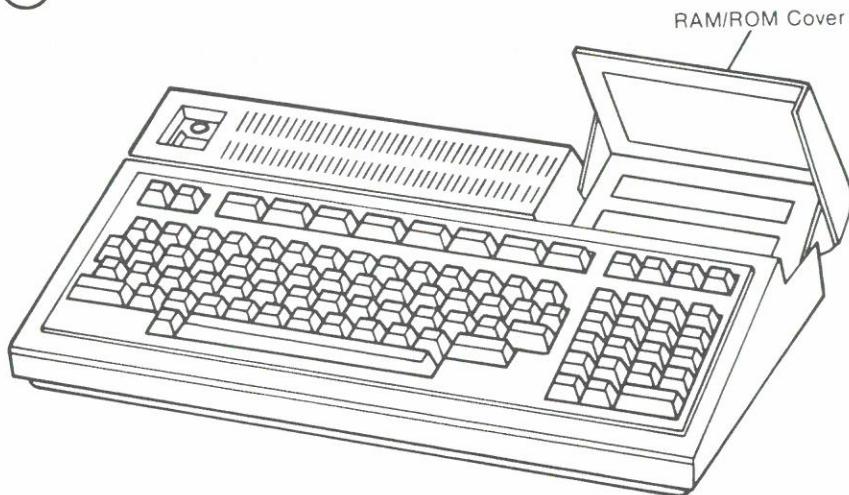


Figure 1.23 Open CPU RAM/ROM Cover

9c

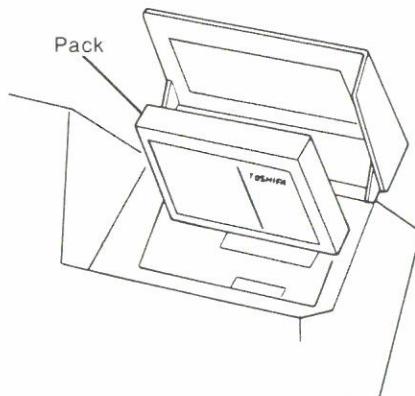


Figure 1.24 Insert RAM And/Or ROM PACK

## RAM AND ROM PACK

9. If you have a RAM PACK or ROM PACK, you can install one or both next.

You insert the packs on the upper right corner of the CPU/Keyboard after you have opened the slot cover, as explained below.

**Do not touch the pins of the RAM or ROM PACK when you handle it.**

- a. Make sure the CPU power switch is OFF.
- b. Gently press inward and upward on the side of the plastic cover on the CPU to open the cover slot.
- c. You can see the two slots on the floor of the RAM/ROM PACK insertion area. The following chart indicates the slot for each type of pack.

<u>PACK</u>	<u>SLOT #</u>
ROM PACK 1	Longer slot (#1)
ROM PACK 2	Shorter slot (#2)
RAM PACK 16	Shorter slot (#2)
RAM PACK 32	Shorter slot (#2)

Insert the RAM or ROM PACK into the slot with the label on the RAM/ROM PACK facing you. A RAM PACK and a ROM PACK may be plugged in at the same time. Be sure the CPU power is OFF when you remove the RAM/ROM PACKs.

## NOTES

## PLUG IN POWER CABLES TO WALL OUTLETS

**POWER GUIDELINES:** You may plug all four power plugs into any three-pronged wall sockets, or into a power strip. The power socket should be 115 V, 60 Hz or 220/240 V 50 Hz AC power. If any unit will not be used for some time, disconnect the plug from the power outlet.

9. Plug each power cable into a wall socket.

**REMINDER:** It is recommended that you save all packing materials in case you need to move your T100.

**CONGRATULATIONS!** You've just installed your computer.

## NOTES

## PART 2

### OPERATING YOUR COMPUTER

## NOTES

## OVERVIEW OF PART 2

Part 2 presents instructions for operating your computer system. The information is presented in the best order for you to learn to use the T100:

- o Understanding The Components
- o Taking Care Of The Disks
- o Turning On The Power
- o Replying To The Initial Screen Requests
- o Using The Cursor
- o Adjusting The Display Screen Brightness
- o Adjusting The Display Tilt/Swivel
- o Write-Protecting The Disks
- o Formatting Disks
- o Copying Disks
- o Using The Keyboard
- o Correcting Typing Mistakes
- o Removing The Disks
- o Labeling The Disks
- o Turning Off The Power

NOTE: If the equipment does not respond according to the operating instructions, consult Part 3, "Trouble-Shooting." If error messages are displayed on your screen, retype your corrected entry on the next line. If that does not work, consult the Programmer's Reference Manual.

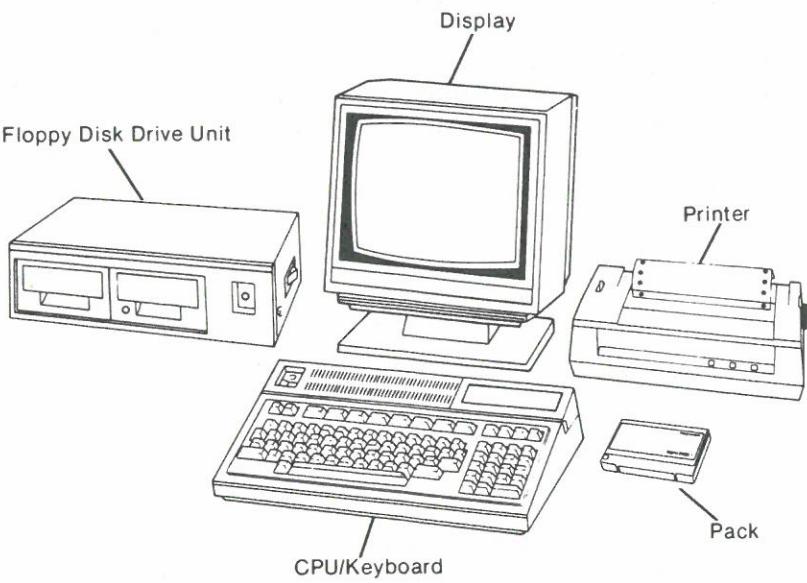


Figure 2.1 T100 Components

## UNDERSTANDING THE COMPONENTS

This section provides general information about the different components of the T100 system. These are shown in the figures at left.

### CPU/Keyboard

The Central Processing Unit, or CPU, is located inside the keyboard unit. The CPU is the control center for the system and uses the built-in ROM (Read Only Memory) and the RAM (Random Access Memory) for processing and storing data. Data and instructions may be entered into the computer via the typewriter-like keyboard. The keyboard also includes a 10-key numeric pad and special programming keys.

### Display

The display (also called a "CRT") has a screen somewhat like a television. The screen may contain up to 2,000 characters of information, 80 characters per line, 25 lines at a time. The displayed image scrolls up when the screen is full and a new line is to be displayed. The T100 also has the capability of displaying graphics and color on the screen. With a TOSHIBA Color Display, you get eight colors: red, blue, green, yellow, purple, light blue, white and black.

### Floppy Disk Drive Unit

Data and programs are stored on "floppy disks." The FDD is the device which allows you to store and retrieve data with the disks. These are thin, flexible disks permanently enclosed in plastic jackets. These 5 1/4" disks are inserted into a floppy disk drive (FDD) unit where information can be written onto the disk or read from it. Since information can be stored, it does not need to be rekeyed constantly on the keyboard.

## Printer

The printer is used to print information from the computer onto paper. Consult your printer manual for further instructions in its use.

## ROM PACKS And RAM PACKS

These PACKS, which are approximately the same size as an audio cassette, are available to extend the utility of your T100. One type of ROM (Read Only Memory) PACK may contain a factory-installed system which can be used to override T-BASIC which is resident in the built-in ROM chip. Such ROM PACKS have a maximum size of 32KB. A second ROM PACK type (maximum size of 24KB) may contain a factory-installed application program similar to the application programs you can write and save on floppy disks. Unlike floppy disk programs, however, you cannot change these application programs. RAM PACKS, which are available in two sizes, 16KB or 32KB, may be used as an alternative to disks as a file storage medium. You can store and read data or programs using RAM PACKS.

## TAKING CARE OF THE DISKS

Floppy disks hold information magnetically and require special care. Protect your disks and the information stored on them by following these precautions:

- o When not in use, disks should be kept in the paper envelopes they came in.
- o Do not touch or attempt to clean the surface of the floppy disk. Fingerprints or cleaning fluid can prevent the disk drive from properly reading the information stored on the disk.
- o The information on the disk can be damaged if the disk is twisted, bent, or dropped sharply, or if it is exposed to direct sunlight, extreme heat or cold, food, liquid or dust particles, including smoke.
- o DO NOT use a pencil or ballpoint pen. If you must write on the label, use only a felt-tipped pen and press lightly. Do not write on the label while it is on the disk. Remove the label or attach a new label.
- o Do not use erasers on the floppy disk label or near the floppy disk.
- o Do not expose the floppy disk to sources of magnetic energy. Keep it away from speakers in radios or televisions.
- o Do not place heavy objects on the floppy disk.
- o Do not use rubber bands or paper clips on the floppy disk.

## NOTES

## TURNING ON THE POWER

To operate your computer, you must first turn on the power. It is important that you turn on the power switches of the different units in a particular order. The following overview lists that order. If you have not used computers, do not turn on your equipment until you read the next pages that lead you, with illustrations, through the steps.

### POWER ON OVERVIEW:

#### IF YOU HAVE A FLOPPY DISK DRIVE:

1. Turn on the display power.
2. Turn on the floppy disk drive power.
3. Insert a system disk (T-DISK BASIC or CP/M). See the precautions for handling disks on the page at left.
4. Turn on the CPU/keyboard power.

#### IF YOU DO NOT HAVE A FLOPPY DISK DRIVE:

1. Turn on the display power.
2. Turn on the CPU/keyboard.

THEN: If you have a printer, turn on the printer power as needed. See your printer manual for operating instructions.

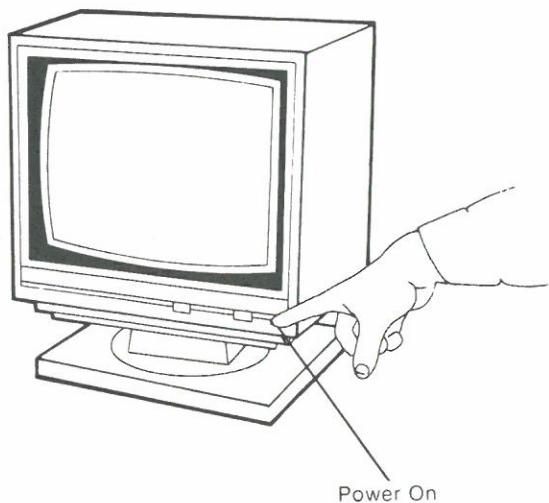


Figure 2.2 Turn On Display Power

NOW BEGIN: TURN ON THE DISPLAY

PRESS: The **power button** for the display located on the lower right front of the unit. (The pushbutton is pushed in when ON and remains out when OFF.)

RESULT: The power indicator light on the display comes on.

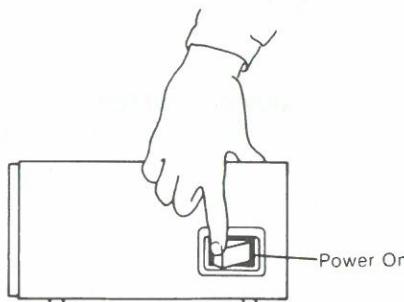


Figure 2.3 Turn On FDD Unit Power

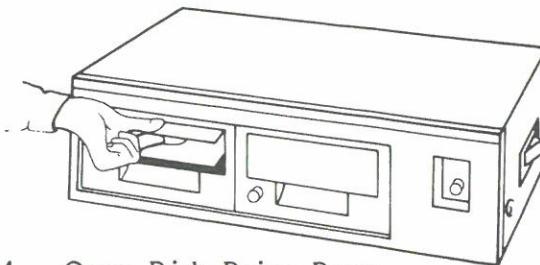


Figure 2.4 Open Disk Drive Door

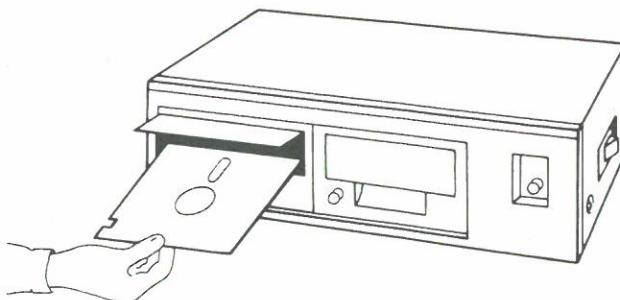


Figure 2.5 Insert Disk

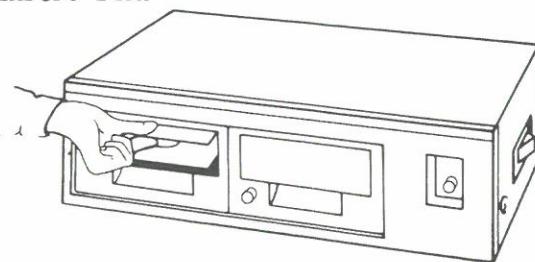


Figure 2.6 Close Disk Drive Door

## TURN ON THE FLOPPY DISK DRIVE UNIT

- PRESS: The **power switch** located on the right rear side of the floppy disk drive.
- RESULT: The power indicator light on the front of the drive comes on.

## INSERT A FLOPPY DISK

- OPEN: The **disk drive door** by raising the lower edge of the cover. A system disk must be inserted in Drive 1.
- SLIDE: The **disk** very carefully into either drive with the label on the disk jacket facing up. Arrows on the disk also show you how to insert it. Be sure you slide the disk all the way into the drive. You will hear it engage.
- CLOSE: The **drive door** by lowering it.
- NOTE: Insert a **system disk** initially with each computer use. After the system disk has been loaded and read, you may remove it and insert other disks. When any disk is in use, the indicator light next to the operating disk drive comes on. Never remove a disk when this light is on, or you can damage the information on the disk. Keep the drive doors closed except to insert or remove a disk.

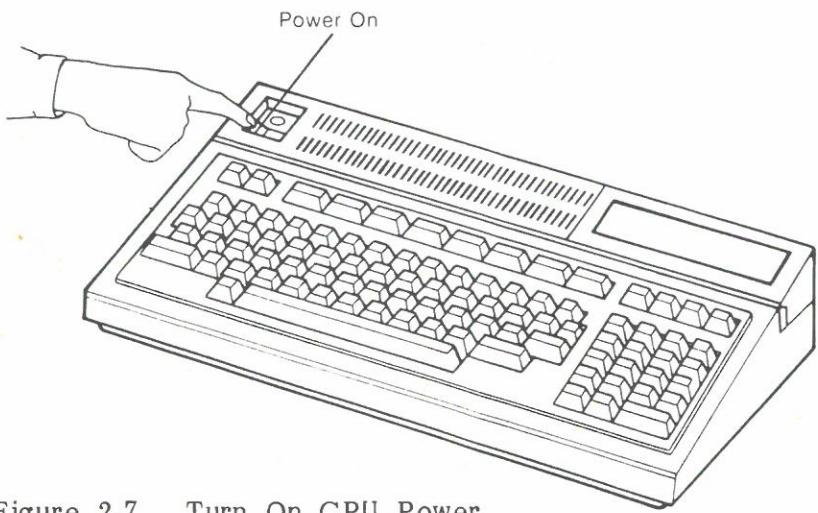


Figure 2.7 Turn On CPU Power

## TURN ON THE CPU/KEYBOARD POWER

WAIT:       **5 seconds** (after turning on the floppy disk drive unit)

PRESS:       The **CPU power button** located on the upper left corner of the unit.

RESULT:      The power indicator light on the CPU comes on.

NOTE:        If the FDD is not turned on, and the CPU is powered on, then T-BASIC is loaded from ROM. If the FDD is turned on with a system disk inserted, and the CPU is powered on, then the disk system is loaded from the disk.

To change from T-BASIC to a disk-based operating system, or to change from one disk-based operating system to another, insert the appropriate system disk in Drive 1 and press the RESET button located on the back right of the CPU.

How many disk drives(1-4)? 2  
How many files(0-15)? 5  
Toshiba T-DISK BASIC Ver. XX  
(c) 1982 by Microsoft  
XXXXX Bytes free  
Ok

-

OBSERVE ON THE THIRD LINE THAT "T-DISK BASIC" IS REFERENCED. T-DISK BASIC IS THE NAME OF THE PROGRAMMING LANGUAGE AVAILABLE WITH USE OF A DISK DRIVE.

REPLYING TO THE INITIAL SCREEN REQUESTS,  
T-DISK BASIC

IF YOU HAVE A FLOPPY DISK DRIVE, AND IT IS TURNED ON WITH A T-DISK BASIC SYSTEM DISK IN IT:

RECEIVE: You will receive on the screen the following message:

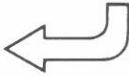
How many disk drives(1-4)?

TYPE: The number "**1**" or "**2**" (If you make a typing mistake, see the section entitled "Correcting Typing Mistakes.")

PRESS:  to tell the computer to read and execute what you just typed.

RECEIVE: How many files(0-15)?

TYPE: **Any value from 0 to 15**, depending on the application. Consult a general BASIC programming book for further information.

PRESS: 

RECEIVE: The screen shown at left.

RESULT: It's "Ok" for you to give the computer instructions.

How many files(0-15)? 5  
Toshiba T-BASIC Ver. XX  
(c) 1982 by Microsoft  
XXXXX Bytes free  
Ok

-

OBSERVE ON THE SECOND LINE THAT "T-BASIC" IS REFERENCED. T-BASIC IS THE NAME OF THE PROGRAMMING LANGUAGE AVAILABLE WITH USE OF THE CPU AND NO DISK DRIVE.

## REPLYING TO THE INITIAL SCREEN REQUESTS, T-BASIC

IF YOU DO NOT HAVE A FLOPPY DISK:

T-BASIC is loaded from ROM in the CPU. T-BASIC includes the operating system and programming language.

RECEIVE: You will receive on the screen the following message:

How many files(0-15)?

TYPE: Any value from 0 to 15 , depending on the application. Consult a general BASIC programming book for further file information.

PRESS:  (This tells the computer to read and execute what you just typed.)

RECEIVE: The screen shown at left.

RESULT: It's "Ok" for you to give the computer instructions.

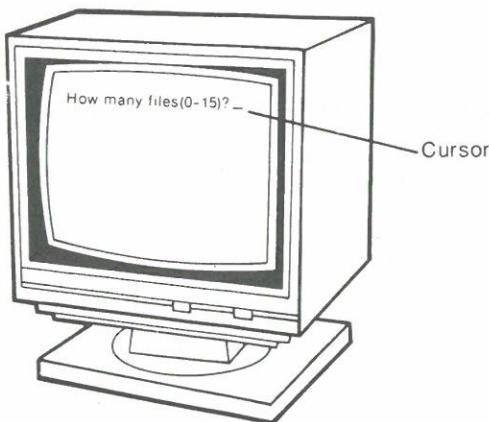


Figure 2.8 The Cursor

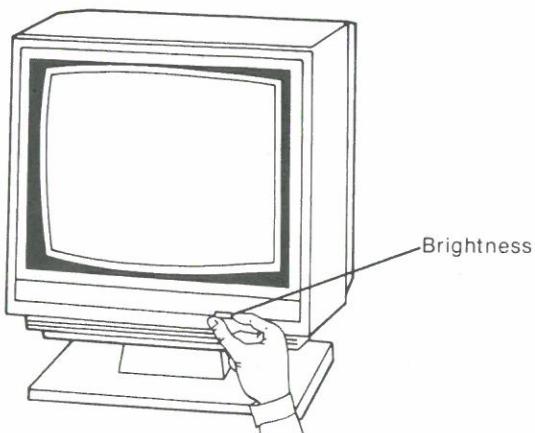


Figure 2.9 Display Brightness

## USING THE CURSOR

The display screen contains a marker that moves like a "bouncing ball" to indicate the next place on the screen where keyboard input will appear. The marker, called the cursor, is in the shape of a flashing underscore. Figure 2.8 at left illustrates the cursor.

When keys are pressed on the keyboard, the entered characters are displayed on the screen and the cursor advances with each new keystroke. You may move the cursor by pressing the arrow keys located near the 10-key pad. If you press the CAPS LOCK key, the cursor becomes three horizontal lines instead of one.

## ADJUSTING THE DISPLAY SCREEN

Now that you have characters on the screen, you may adjust their intensity for your eye comfort. Simply slide the control labeled BRIGHTNESS from DARK to BRIGHT until you find a comfortable setting. (The control is shown at left in Figure 2.9.)

Both the color and monochrome display have the following user adjustable controls: Brightness, Height, V.Hold and Focus.

In addition, the monochrome display has an adjustment for Contrast. A Termination Switch is located on the back. If you are using only one monochrome display, the Termination Switch should be set to 75 ohms. If you are employing more than one display unit (up to four), the switch on each display should be set to infinity, except for the last display in the chain. The switch on the last display should be set to 75 ohms.

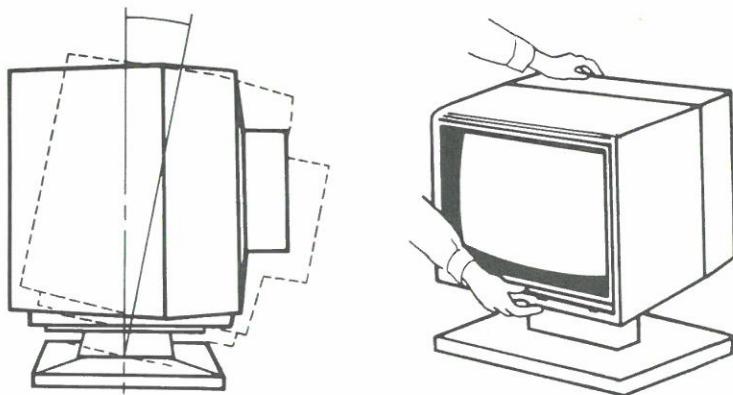


Figure 2.10     Display Tilt/Swivel

## ADJUSTING THE DISPLAY TILT/SWIVEL

The unique tilt/swivel base of your display allows you to tilt it 5 degrees forward, 10 degrees backward and swivel it 45 degrees to the left or right. This allows you to minimize glare and maximize readability of the characters on the screen. Push the monitor forward and backward until it is best suited for you. Use both hands when adjusting the display and apply firm, steady pressure as shown in Figure 2.10.

## NOTES

NOTE: IF THIS IS A LONG ENOUGH FIRST SESSION FOR YOU, SKIP TO THE "REMOVING THE DISKS" SECTION IF YOU HAVE THEM, OR TO "TURNING OFF THE POWER" IF YOU DO NOT.

THEN, WHEN YOU WANT TO RESUME LEARNING HOW TO OPERATE YOUR COMPUTER, START AGAIN AT THE BEGINNING OF PART 2 AND PROCEED TO THE FOLLOWING PAGES TO LEARN MORE ABOUT OPERATING YOUR T100.

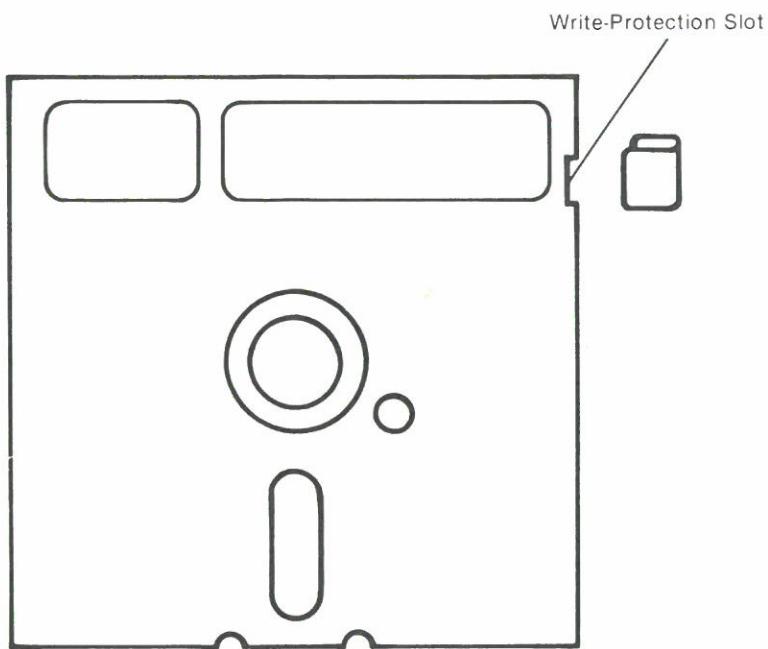


Figure 2.11 Disk Write-Protection Slot

## WRITE-PROTECTING FLOPPY DISKS

Occasionally, you will want to protect the information on your disk so that the data on it may not be accidentally changed. You may accomplish this by placing a small piece of silver paper over the "write-protection" slot as indicated in the illustration at left. Your disk becomes "read only." To write on the disk again, simply remove the silver paper.

You should now write-protect both of your system disks (T-DISK BASIC and CP/M).

## SETTING UP NEW T-DISK BASIC DISKS (FORMATTING)

You receive two very important disks with your floppy disk drive unit: the T-DISK BASIC system disk and the CP/M system disk. Prior pages instructed you to write-protect these disks. You should also make backup copies of them and store the originals.

The following pages will teach you the different procedures for copying CP/M and T-DISK BASIC disks. Before you can copy to a disk or use any blank disks in any way, you must first "format" them. Be very careful to format only blank disks, as formatting erases any information on a disk. Formatting is also different for the two types of system disks.

The following directions for T-DISK BASIC formatting assume that you have replied to the initial screen requests and received the prompt **Ok**.

INSERT:        The **System Disk** in Drive 1 (the one on the left).

PRESS:        **PF2**

RECEIVE:        LOAD "

TYPE:        **FORMAT** (right after LOAD ", all in uppercase)

PRESS:



RESULT: The system loads the FORMAT program from the System Disk.

RECEIVE: Ok

PRESS: PF8

RECEIVE:

Toshiba Personal Computer T100  
  <<Formatting>> Rev. X.X  
  Drive 1-4 = Floppy Disk  
    5 = RAM PACK  
    0 = Stop  
Enter Drive number?

\*\*\*\*\*

INSERT: The **new disk** to be formatted in Drive 2 (the one on the right).

TYPE: 2

PRESS:



RECEIVE: Is floppy disk to be formatted as System Disk (Y/N)?

DO YOU WANT TO COPY THE SYSTEM PART IN  
ADDITION TO FORMATTING?\* (When first backing up your system disk, you definitely type "Y" for yes.)

YES  
TYPE: Y

NO  
TYPE: N

CONTINUED ON NEXT PAGE

PRESS:



AFTER THE DISK HAS BEEN FORMATTED

RECEIVE:

Drive 1-4 = Floppy Disk  
5 = RAM PACK 2  
0 = Stop  
Enter Drive number?

DO YOU HAVE MORE NEW DISKS TO FORMAT (such as blank disks to be used for data or programs)?

YES

NO

REPEAT:

From the **asterisks** TYPE: **0**

above.

PRESS:



RECEIVE:

End  
Ok

- \* You may create a disk without the system portion on it if it is to be used just for files.

## COPYING T-DISK BASIC DISKS

Copies should be made of the system disks and other important disks. The following gives the T-DISK BASIC instructions for copying the contents of a disk to another disk. These directions assume that you have turned on your system and have received the prompt "Ok" after the initial screen displays.

INSERT: The **System Disk** in Drive 1 (on left).

PRESS: **PF2**

RECEIVE: **LOAD"**

TYPE: **VOLCOPY** (on the same line after LOAD";  
VOLCOPY must be in uppercase)

PRESS:



RESULT: The system loads the program VOLCOPY from the T-DISK BASIC system disk.

RECEIVE: **Ok**

PRESS: **PF8**

RECEIVE:  
Toshiba Personal Computer T100  
<<Floppy Copy (volume)>> Rev. X.X  
Enter Drive number (1,2,3,4)  
(0 = Stop)  
Original drive? \_\_\_\_\_

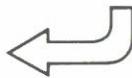
CONTINUED ON NEXT PAGE

\*\*\*\*\*

INSERT: The **original disk** to be copied in Drive 1.

TYPE: **1** (by "Original drive?")

PRESS:



RECEIVE: Copy drive?   

INSERT: The **formatted disk** you want to copy to in Drive 2.

TYPE: **2** (by "Copy drive?")

PRESS:



RECEIVE: Setting...Ok (Y/N)?

CHECK: To verify that you typed the right drive numbers. Otherwise, you could erase the disk you want to copy.

TYPE: **Y** (if the settings are correct, or "**N**" if not and you want the screen cleared to correct it)

PRESS:



RESULT:

Drive 1 disk is copied to Drive 2 disk.

RECEIVE:

Enter **Drive number** (1,2,3,4)

(0 = Stop)

Original drive?   

Copy drive?   

DO YOU HAVE MORE DISKS TO COPY?

YES

NO

REPEAT:

From the asterisks  
above.

TYPE:

0

PRESS:



RECEIVE:

End  
Ok

## SETTING UP NEW CP/M DISKS (FORMATTING)

The following gives the instructions for formatting CP/M disks.

INSERT: The **CP/M system disk** in Drive #1 (on the left)

INSERT: The **disk to be formatted** in Drive 2 (on the right)

TYPE: **FORMAT**



PRESS:

RECEIVE: TOSHIBA CP/M X.X FORMAT UTILITY  
Step 1 > Insert A NEW disk in Drive #2  
REMEMBER >> If this disk has data on it this will erase it totally.

Press RETURN to begin format or  
BREAK to end

PRESS:



RECEIVE: TOSHIBA CP/M X.X FORMAT UTILITY  
Formatting Disk Now ..... Please Wait  
Track #XX

NOTE: The Drive 2 light will flash indicating that formatting is in progress.

RECEIVE:

TOSHIBA CP/M X.X FORMAT UTILITY  
Format Now Complete! ..... Remove Disk  
Press RETURN to continue format or  
BREAK to end

NOTE: You may receive the following error message:

TOSHIBA CP/M X.X FORMAT UTILITY  
Bad Disk Please Try Another!  
Press RETURN to continue format or  
BREAK to end

## COPYING CP/M DISKS

The following gives the instructions for copying CP/M disks.

INSERT: The **CP/M system disk** in Drive #1 (on the left)

TYPE: **COPY**

PRESS:



RECEIVE:

TOSHIBA CP/M X.X COPY UTILITY  
Step 1 > Insert SOURCE disk in Drive #1  
Step 2 > Insert FORMATTED disk in  
Drive #2  
Press RETURN to begin copy or  
BREAK to end

PRESS:



NOTE: The drive lights will flash indicating copy is in progress.

RECEIVE:

TOSHIBA CP/M X.X COPY UTILITY  
Copying Disk Now ..... Please Wait  
Track #XX

RECEIVE:

TOSHIBA CP/M X.X COPY UTILITY  
Copy Now Complete! ..... Remove Disks  
Press RETURN to continue copy or  
BREAK to end

NOTE:

You may receive the following error  
message:

Bad Disk Please Try Another!  
Press RETURN to continue copy or  
BREAK to end

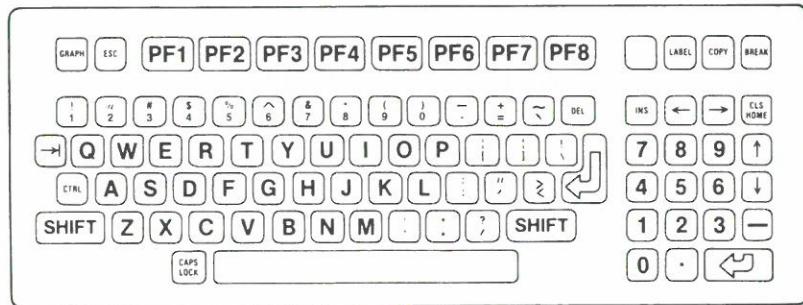


Figure 2.12 Keyboard

## USING THE KEYBOARD

In many ways, the T100 keyboard is similar to an ordinary typewriter keyboard. The T100, however, has a 10-key numeric pad somewhat like a calculator and other special keys for using a computer. Now that you have copied your system disk, you may experiment with the keyboard. First, you'll learn about the different keys. Then, you may want to practice using them. As you type and fill up a line, the cursor will move automatically to the next line.

The keyboard, shown at left, contains four types of keys:

- o Data keys
- o Line editing keys
- o Special function keys
- o Program function keys

The description of the key functions in this manual apply to T-BASIC and T-DISK BASIC. Variations may occur with the use of other operating systems.

### Data Keys

The off-white keys contain uppercase and lowercase characters, numeric characters and special symbols. These keys, along with the space bar, the SHIFT key and the CAPS LOCK key, are operated as on a standard typewriter.

When the CAPS LOCK key is pressed, uppercase letters may be entered without holding the SHIFT key. Pressing the CAPS LOCK key again returns the lowercase mode. If you wish to retain the CAPS LOCK mode and type a few lowercase letters, hold the SHIFT key while typing the letters you want to be lowercase.

The 10-key numeric pad is located on the right side to aid in entering numbers.

Line editing keys are used to edit the current line of input. These keys are located above the keyboard and include PF1 through PF8, a numeric keypad, and several function keys. The numeric keypad includes a cursor key pointing right, which is used to move the cursor to the right of the current character. The function keys include a cursor key pointing left, which is used to move the cursor to the left of the current character. The function keys also include a cursor key pointing up, which is used to move the cursor to the previous line, and a cursor key pointing down, which is used to move the cursor to the next line.

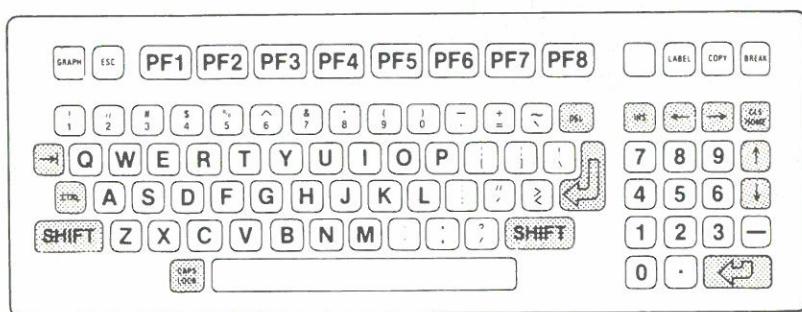


Figure 2.13 Line Editing Keys

## Line Editing Keys

Line editing keys, highlighted at left, may be pressed when you enter data to send, correct or repeat data.

KEY	DESCRIPTION
	The Tab key moves the cursor to the next tab. Tabs are preset for every 8 characters of a line.
<b>CTRL</b>	The <b>CTRL</b> (Control) key is always used simultaneously with another key to enter an instruction. (See Appendix C.)
<b>SHIFT</b>	The <b>SHIFT</b> keys either cause a letter to be uppercase, or the top symbol on a key (if it has one) to be displayed.
<b>CAPS LOCK</b>	Pressing the <b>CAPS LOCK</b> key causes letters to appear on the screen in uppercase. Pressing the key again returns lowercase letters.
<b>DEL</b>	Pressing the <b>DEL</b> key deletes the character preceding the cursor.
	Pressing the Return key indicates to the computer that all the information since the Return key was last pressed should be acted upon. It moves the cursor from its last position on the line to the first position of the next line.

## NOTES

**INS**

Pressing the **INS** key inserts a space where the cursor is positioned. All data to the right of the cursor is moved to the right.



Pressing the left arrow moves the cursor to the left one position for each key stroke. This repeats when the key is held down.



Pressing the right arrow moves the cursor to the right one position for each key stroke. This repeats when the key is held down.



Pressing the up arrow moves the cursor up one line for each keystroke.



Pressing the down arrow moves the cursor down one line for each key stroke.

**CLS**

**WITHOUT PRESSING SHIFT:** Moves the cursor to the "home" position—the first character position on the top of the screen.

**WHILE PRESSING SHIFT:** Erases the screen and moves the cursor to home position.

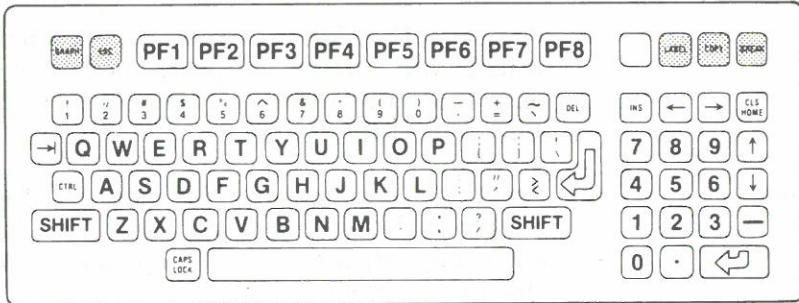


Figure 2.14 Special Function Keys

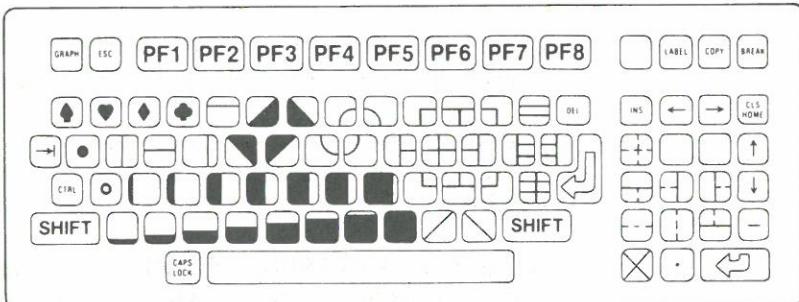


Figure 2.15 Graphics

## Special Function Keys

Pressing special function keys tells the system to perform certain functions.

KEY	DESCRIPTION
<b>GRAPH</b>	Pressing a letter or numeric key while the <b>GRAPH</b> key is also pressed displays a graphic symbol on your display screen. For example, holding the GRAPH down and pressing "2" gives you a heart symbol. The keyboard and printout at left show the available graphics.
<b>ESC</b>	Pressing the <b>ESC</b> (escape) key lets you "escape" from a line you are typing and retype the line. Pressing this key enables you to stop a program from running.
<b>LABEL</b>	Pressing the <b>LABEL</b> key displays on the 25th line of the screen the functions assigned to the programmable function keys.
<b>COPY</b>	Pressing the <b>COPY</b> key causes the current screen display to be printed on the printer. Pressing the key again stops the printing. If graphics are included, this feature may not work with all printers. This feature is not available with CP/M.
<b>BREAK</b>	Pressing the <b>BREAK</b> key stops a program while it is running.

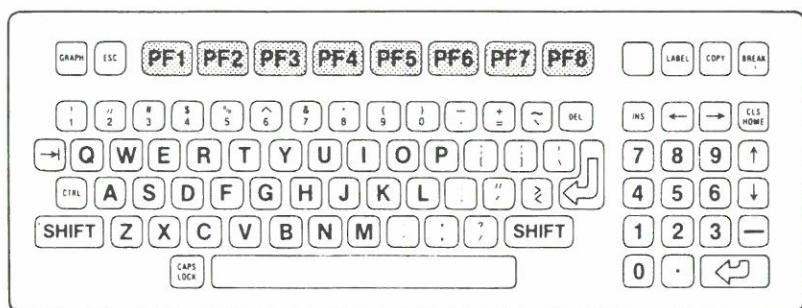


Figure 2.16 Programmable Function Keys

## **Programmable Function Keys**

Eight programmable function (PF) keys, **PF1** through **PF8**, are highlighted in the illustration at left. Pressing each key causes a particular command to be executed. You do not press the Return key after the PF key.

At any time you may type the complete command rather than use the PF keys. The use of these default commands under T-BASIC is explained in detail in the Programmer's Reference Manual.

<u>PF KEY</u>	<u>COMMAND</u>
PF1	FILES
PF2	LOAD
PF3	SAVE
PF4	?TIME\$
PF5	EDIT
PF6	KEY
PF7	LIST
PF8	RUN

## EXERCISE 1

### **Overstriking**

TYPE: **paimt**

PRESS: The left arrow twice to position the cursor under the **m**: **paimt**

TYPE: **n** over the **m**: **paint**

## EXERCISE 2

### **Deleting**

TYPE: **paiint**

PRESS: The left arrow twice to position the cursor under the **n**: **paiint**

PRESS: The **DEL** key and the second **i** is removed: **paint**

REMEMBER: The **DEL** key deletes the character to the left of the cursor.

## CORRECTING TYPING MISTAKES

Everyone makes typing mistakes, so it is important to know how to correct them. When you are entering characters on a line and have not yet pressed , three methods are available for correcting a mistake.

These three methods are explained in the following section. Exercises to learn them are given on the accompanying pages at left.

### Overstriking

PRESS: An **arrow key** to move the cursor under the incorrect character.

TYPE: The **correct character** over the incorrect one.

NOTE: To go to the next line, press . **Unless you press , your changes will not be registered.** To continue typing on the same line, press the right arrow to move you past the word and then continue typing on the line. Remember to press  at the end of the line.

### Deleting

PRESS: The **arrow keys** to move the cursor under the character TO THE RIGHT of the incorrect character.

PRESS: The **DEL key** which deletes the incorrect character.

PRESS:  to register the deletions.

## EXERCISE 3

### **Inserting**

TYPE: **pait\_**

PRESS: The left arrow once to position the cursor under the **t**: **pait\_**

REMEMBER: The **INS** key inserts a space where the cursor is positioned and moves the **t** one space to the right.

PRESS: The **INS** key and one space is inserted:  
**pai\_t**

TYPE: **n**

RESULT: **paint**

## **Inserting**

- PRESS: The **arrow keys** to move the cursor under the character TO THE RIGHT of the position where the new character is to be inserted.
- PRESS: The **INS** (insert) key once for each new character to be inserted.
- TYPE: The **character(s)** to be inserted.
- PRESS:  to register the insertions.

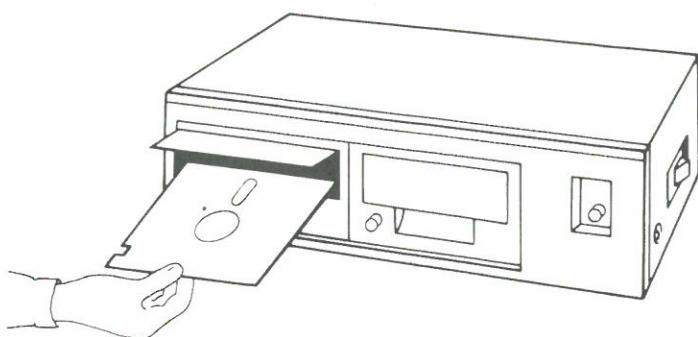


Figure 2.17 Remove Disk

## REMOVING THE DISKS

You may remove a particular disk when you are finished using it. You may also remove any disks before turning off the computer.

CONFIRM: That the red busy indicator light on the floppy disk drive is **OFF**. NEVER REMOVE THE DISK WHEN THE LIGHT IS ON. YOU COULD LOSE THE INFORMATION ON THE DISK.

OPEN: The floppy disk **drive door(s)**.

SLIDE: Each **disk** out gently.

PLACE: The **disk** in its protective envelope.

CLOSE: The disk **drive door(s)**.

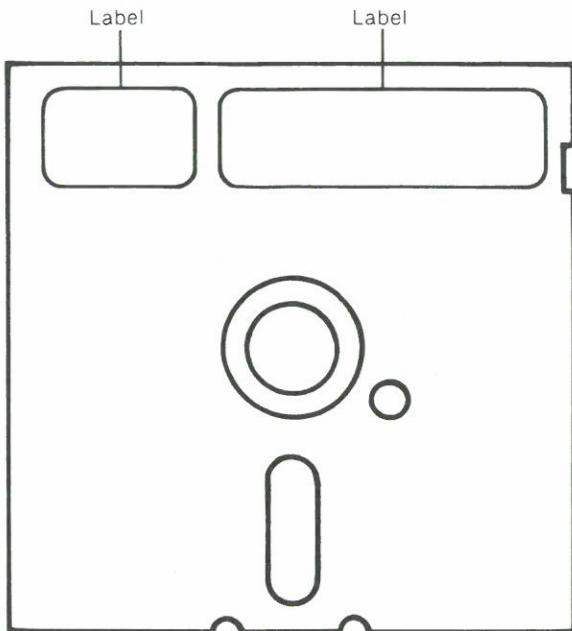


Figure 2.18 Disk Labels

## LABELING FLOPPY DISKS

Two labels may be affixed to a floppy disk as shown in the illustration at left. One label can identify the disk type, show the number of bytes available for storage and indicate the proper way to insert it. Labels are available that may be affixed to a disk for the purpose of identifying the contents of the disk. Use the labels that come with new disks. Before attaching a label to a disk, write identifying information on it. Do not write on a label that is on a disk. Place the label on the disk, not on the protective envelope.

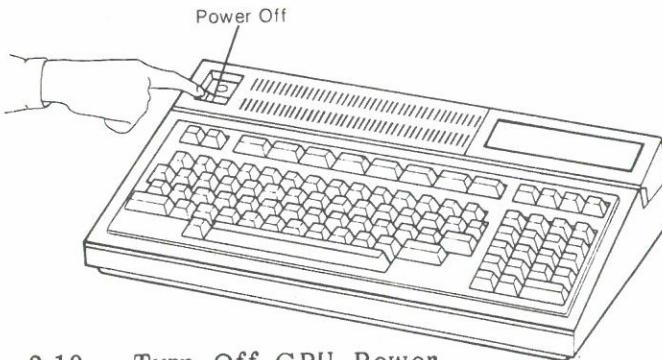


Figure 2.19 Turn Off CPU Power

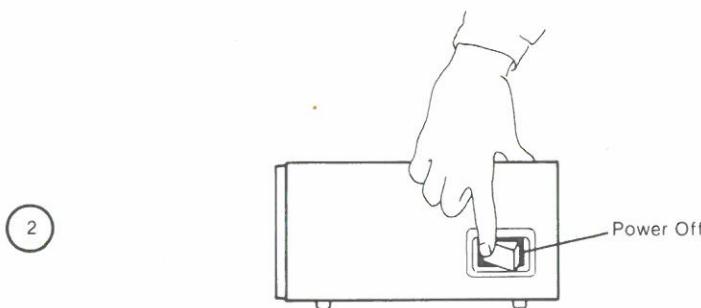


Figure 2.20 Turn Off FDD Unit Power

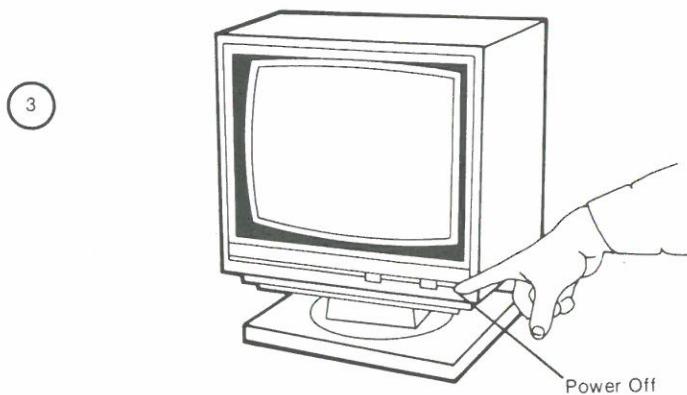


Figure 2.21 Turn Off Display Power

## TURNING OFF THE POWER

The power switches (see Figures 2.19, 2.20 and 2.21) must be turned off in a specific sequence. Omit any units listed that you do not have:

1. CPU/Keyboard
2. Floppy disk drive
3. Display
4. Printer (See your manual.)

## NOTES

## PART 3

### TROUBLE-SHOOTING

## NOTES

## OVERVIEW OF PART 3

This section is designed to help you diagnose and resolve problems in using your T100, or which are the result of equipment malfunctions.

This Trouble-Shooting guide takes you through the key steps you will need to determine which unit of your T100 is the source of an equipment malfunction.

Before you attempt trouble-shooting, there are several things you should know.

- o Aside from using this guide to trouble-shoot your T100, you should not attempt further repair action. Attempts to perform service inside of the covers of the T100 cannot only be dangerous to you, but may also result in the warranty on your T100 being rendered void.
- o TOSHIBA products have a well deserved reputation for reliability. The probability that hardware malfunction is responsible for a problem with your system is very small. Usually, the cause of a problem will not be the computer hardware. When a problem occurs, ask yourself what has changed or is new about your use of the computer. Also remember that hardware failures are seldom subtle. The usual result of a hardware failure is that the unit is totally inoperable.
- o Use all of your senses when you trouble-shoot hardware. Do you smell a "warm" or "sour" smell? (Remember that new units will smell "new.") Are there unusual sounds when the equipment is operating? Does any unit feel hot? (Hot is when you cannot hold your hand on the unit without concern for injury to your hand.)

Most of all, be "machine wise." When something unexpected happens, check to see if other programs run. The organization of the T100 utilizes most of the system for most functions. If one program will run and another will not, chances are that the program is at fault.

- o Finally, be careful. Don't remove the covers on the equipment. While there are only a few places where dangerous voltages are present, there are some. The cost of having a unit repaired is not great enough to risk injury to yourself.

## TROUBLE-SHOOTING GUIDE

This guide uses a step-by-step procedure to diagnose equipment malfunctions on your T100. It is intended for use with TOSHIBA supplied equipment and if used on a T100 attached to non-TOSHIBA equipment, it can result in an incorrect diagnosis. To use this guide, begin by disconnecting all units from the T100 CPU/Keyboard.

### STEP 1

- |         |   |
|---------|---|
| Action  | Turn on the On/Off switch on the T100 CPU/Keyboard.   |
| Check   | Is the green light above the On/Off switch lit?   |
| YES     | Go to STEP 2.   |
| NO      | Check that the T100 CPU/Keyboard is plugged into a "live" outlet by plugging a lamp or other device into the outlet. If the outlet is good, then verify that the <u>same</u> power cord is also plugged into the "AC IN" plug on the rear of the T100 CPU/Keyboard. Verify that the power cord is good by substituting the cord from another unit such as the T100 floppy disk drive unit or printer.<br><br>If the power cord requires replacement, see the Service Policy section for information on how to arrange for a repair. |
| Problem | If the light still does not light up, the problem is in the CPU/Keyboard. See the Service Policy section for information on how to arrange for a repair.  |

## STEP 2

- Action With the On/Off switch in the ON position and the volume control on the rear of the CPU/Keyboard turned fully clockwise, depress and hold down the "H" key.
- Check Do you hear the repeat "clicker" sound?
- YES Go to STEP 3.
- NO Verify that the On/Off switch is in the ON position, that the green light is lit and that the volume control is turned fully clockwise.
- Problem If you still cannot hear the "clicker" sound, the problem is in the CPU/Keyboard. See the Service Policy section for information on how to arrange for a repair.

## STEP 3

- Action With the T100 Display disconnected from the CPU/Keyboard, push the On/Off switch on the front of the display in to the ON position.
- Check Is the green light on the front of the display lit?
- YES Go to STEP 4.
- NO Check that the display is plugged into a "live" outlet by plugging a lamp or other device into the outlet.

Problem If the light still does not light up, the problem is in the display unit. See the Service Policy section for information on how to arrange for a repair.

#### STEP 4

Action With On/Off switch still in the ON position, move the brightness control on the front of the display to the BRIGHT position (far right).

Check Is a raster (a series of thin, white, horizontal lines) displayed?

YES Go to STEP 5.

NO Verify that the On/Off switch is in the ON position, that the green light is lit and that the Brightness control is in the BRIGHT position.

Problem If a raster is still not displayed, the problem is in the display. See the Service Policy section for information on how to arrange for a repair.

#### STEP 5

Action TURN OFF THE POWER ON THE CPU/KEYBOARD AND THE DISPLAY BEFORE PROCEEDING. Inspect the interface cable for signs of damage. If the cable requires replacement, see the service policy section for information on how to arrange for a repair.

Connect the interface cable between the rear of the display and the appropriate connector port on the CPU/Keyboard. (See Part 1 of this manual.)

Push ON the On/Off switch on the display. Wait until the raster described in STEP 4 appears. Turn ON the On/Off switch on the CPU/Keyboard. Wait at least 10 seconds.

Check Has the question, "HOW MANY FILES (0-15)?" or some other message appeared on the screen?

YES Go to STEP 6.

NO Verify that you have correctly followed the instructions given in the Action portion of this step.

Problem The problem at this point is undefined. Go to STEP 6 and perform the indicated Action and Check. If the result of STEP 6 is YES, then the problem is the display. If the result of STEP 6 is NO, then the problem is the CPU/Keyboard. See the Service Policy section for information on how to arrange for a repair.

## STEP 6

Action VERY CAREFULLY, enter the following into the T100:

1 ↙  
SOUND 50,50 ↙

Check Was the above sequence followed by a short tone from the CPU/Keyboard?

- YES      If the display and the CPU/Keyboard units seem to be performing correctly at this point, then proceed to STEP 7. If the tone check was correct and there is still nothing displayed on the display, then the problem is in the display. See the Service Policy section for information on how to arrange for a repair.
- NO      Press the Reset button on the rear of the CPU/Keyboard. Re-enter the sequence above. Be very careful. If the display is not working, it can be very confusing to enter the sequence without being able to see what you are entering.
- If the tone is still not heard, then the problem is in the CPU/Keyboard. See the Service Policy section for information on how to arrange for a repair.
- Problem      As defined in YES and NO.

### STEP 7

- Action      Adjust the Brightness on the display to a comfortable level. Also adjust the Contrast on the green display to the desired level. The failure of either of these adjustments to perform properly means that the display needs repair. See the Service Policy section to arrange for a repair.

Verify the function of each key on the keyboard. (The COPY key and some of the function keys will not work without the appropriate device connected to the T100.) If there are any keys which do not perform correctly, then the CPU/Keyboard must be repaired. See the Service Policy section to arrange for a repair.

If you have a Fine Color Display, then enter the following sequence:

<u>ENTER</u>	<u>LOOK FOR</u>
COLOR 0,1 ↵	Black On Blue
COLOR 1,2 ↵	Blue On Red
COLOR 2,3 ↵	Red On Purple
COLOR 3,4 ↵	Purple On Green
COLOR 4,5 ↵	Green On Light Blue
COLOR 5,6 ↵	Light Blue On Yellow
COLOR 6,7 ↵	Yellow On White
COLOR 7,0 ↵	White On Black

The failure of any of these colors to display correctly means that the display must be repaired. See the Service Policy section to arrange for a repair.

Check      If everything to this point has checked out, then it is safe to assume that the base system is operating correctly. The CPU tests itself every time it is powered on and the rest of the functions (exclusive of disk and printer) have been verified. If your problem appears to be floppy disk drive unit or printer related, proceed to the next step. Otherwise, the problem might be software-related.

## STEP 8

- Action      TURN THE POWER OFF ON ALL UNITS. With the floppy disk drive unit disconnected from the CPU/Keyboard, turn the On/Off switch on the right side of the floppy disk drive unit to the ON position.
- Check      Is the green light marked POWER on the front of the disk drive unit lit? Verify that the fan at the rear of the unit (above the "AC IN" plug) is operating by placing your hand over the grate and feeling for airflow out from the disk drive unit.
- YES      Go to STEP 9.
- NO      Check that the disk drive unit is plugged into a "live" outlet by plugging a lamp or other device into the outlet. If the outlet is good, verify that the same power cord is also plugged into the "AC IN" plug on the rear of the disk drive unit. Verify that the power cord is good by substituting the cord from another unit such as the CPU/Keyboard or the printer.  
  
If the power cord requires replacement, see the Service Policy section to arrange for a repair.
- Problem      If the light still does not light or if the fan is not running, the problem is in the disk drive unit. See the Service Policy section to arrange for a repair.

## STEP 9

- Action      TURN THE POWER OFF ON THE FLOPPY DISK DRIVE UNIT. Inspect the interface cable for signs of damage. If the cable requires replacement, see the Service Policy section to arrange for a repair.
- Connect the interface cable between the rear of the disk drive unit and the "EXT. BUS" port on the rear of the CPU/Keyboard. Turn on the display power. Wait a short time and then turn on the CPU/Keyboard power.
- NOTE: IF FOR ANY REASON THE MESSAGE, "HOW MANY FILES (0-15)?" DOES NOT APPEAR ON THE DISPLAY AT THIS TIME, RETURN TO STEP 1.
- Turn on the disk drive power. Place a good T-DISK BASIC system disk in Drive 1 with the label up and the head access groove toward the rear of the disk drive unit.
- Push the RESET button on the rear of the CPU/Keyboard.
- Check      Does the appropriate load message appear on the display?
- YES        Go to STEP 10.
- NO         Place a system disk in Drive 2. Push the Reset button described above. If the appropriate message still fails to appear, try one or more other system disks and repeat the process in both Drive 1 and Drive 2.

Problem If, after several system disks, the appropriate message has still not appeared, the disk drive unit must be repaired. See the Service Policy section to arrange for a repair.

#### STEP 10

Action NOTE: If your original problem was intermittent disk errors, clean the heads using a Floppy Disk Head Cleaning Kit before proceeding.

Format a disk in Drive 1 and then in Drive 2.

Copy a disk from Drive 1 to Drive 2. Reverse the copy and go from Drive 2 to Drive 1.

Check Did the format and copy functions execute correctly?

YES The disk drive unit is functioning properly. If intermittent disk errors persist and cleaning with a Floppy Disk Head Cleaning Kit does not help, it will be necessary to have the disk drive unit repaired. See the Service Policy section to arrange for a repair.

If your problem is with the printer, proceed to the next step.

NO, Verify that you are operating the format and copy programs properly.

Problem If the format and copy programs still do not execute, the disk drive unit must be repaired. See the Service Policy section.

## STEP 11

Action Since many types of printers can be connected to your T100 Personal Computer, refer to your printer manual for instructions on trouble-shooting your printer.

Inspection of the printer interface cable and the execution of program print routines will normally eliminate the T100 as the cause of printer related failures.

Interface problems encountered during installation can often be resolved with the assistance of the T100 Technical Reference Manual which is available from your TOSHIBA dealer.

Your TOSHIBA T100 Personal Computer should be fully operable if you have reached this point without a problem. If you are still experiencing problems with your T100, you should refer to the Service Policy section of this manual for information on obtaining further assistance.

## PART 4

### COMPUTER LANGUAGE INTRODUCTION

## NOTES

## OVERVIEW OF PART 4

BASIC is probably the most popular language for beginners to learn and use for programming a computer. T-BASIC is TOSHIBA's version of BASIC supplied on the T100. If you have not programmed before, it would be wise for you to obtain a BASIC language self-teach book, or take a beginning course in programming.

In the following pages, we will show you a few sample programs which use T-BASIC. The first ones are simple enough that you should be able to practice them on your T100 even if you have never programmed before. You are also shown ways to correct programs on your T100.

You can begin programming after you have turned on your T100 computer, replied to its initial questions, and received the **Ok**.

Should you wish more detailed information, consult the Programmer's Reference Manual.

## RUNNING A SHORT BASIC PROGRAM

Whether you have T-BASIC, or T-DISK BASIC, you may type the following program on your screen:

```
10 A=3  
20 B=7  
30 C=A+B  
40 PRINT C
```

The 10, 20, 30 and 40 are line numbers. These keep the lines in order, and tell the computer that you are entering a program rather than a direct command. The A, B and C identify variables to the computer. Line 10 says make variable A equal to 3. Line 20 says make variable B equal to 7. Line 30 says add A and B and make their sum equal to C. Line 40 prints the sum C.

All of the examples in this section are shown in uppercase. You may, however, program in either upper or lowercase.

Did you make any typing mistakes? If so, you may correct them while on the same line by overstriking, inserting or deleting. But even after you have left the line by pressing  , you may correct the program as follows:

### To Change a Line:

Retype the line number followed by the new information. For example, type:

```
10 A=20+40
```

and press  to send that information to the computer. The old line 10 is replaced entirely.

### To Add a Line:

Type a new line number followed by the new information. For example, type:

```
35 D=A-B  
50 PRINT D
```

and press  after each line. This adds two new lines to the program.

### To Remove a Line:

Type the line number and press  . You are effectively telling the computer that the line is empty of instructions. For example, to delete the lines you just added, type:

```
35   
50 
```

Lines 35 and 50 are now removed from the program.

### To Check the Program:

Just in case you're wondering whether the changes were made on the program properly, the direct command "LIST" can tell you. Type:

```
LIST
```

Press .

The screen now shows your current program.

### To Execute the Program:

What you have done so far is to enter a program on the screen, and make some corrections to it. To tell the computer to execute that program, type the direct command **RUN** as shown below:

```
10 A=20+40  
20 B=7  
30 C=A+B  
40 PRINT C  
RUN
```

Press .

The computer calculates the answer **67** and displays it on the screen.

CONGRATULATIONS! YOU'VE JUST RUN A PROGRAM.

## MORE SAMPLE PROGRAMS

The following programs are examples of the types of programs which may be run on a T100 in T-BASIC. The first two programs will be done in color. If you have a green display, you may still run the programs. The contrasts will be shown in a varying green color scale.

### 1. DRAWING CIRCLES WITH CHANGING COLOR

Example:

```
10 SCREEN 1
20 CLS
30 WIDTH 80
40 COLOR 0,7
50 FOR M=0 to 6
60 FOR N=1 to 41 STEP 2
70 COLOR M:CIRCLE (80,50),N
80 NEXT N
90 NEXT M
100 GOTO 40
```

Now type **RUN** or press **PF8** to run the program. To stop the program, press the **BREAK** key.

## 2. DRAWING SQUARES WITH CHANGING COLOR

Example:

```
5 CLS
10 SCREEN 1
30 WIDTH 80
40 COLOR 0,7
50 INPUT "Type any number from 1 to 75";X
55 CLS
60 FOR N=1 TO 6
70 X=X+5:Y=X+15
80 LINE (X,X)-(Y,Y) ,N,BF
90 X=X+3
100 NEXT N
120 GOTO 50
```

Type **RUN** or press **PF8** to run the program.

## 3. MUSIC PROGRAM

Example:

```
10 FOR I=1 TO 82
20 SOUND I,10
30 NEXT I
```

Type **RUN** or press **PF8** to run the program.

## APPENDICES



NOTES

## APPENDIX B

### USING A CASSETTE

A "CASSETTE" connection is available on the back of the CPU. Audio cassettes provide an alternative to disk storage. If you need greater power and reliability, you may at some point want to expand your system to include a disk drive unit.

You will need to connect the cassette recorder only when you want to store programs or load them from the cassette. The following is the procedure for connecting your cassette to the CPU/Keyboard:

#### Cassette Connection

- a. Remove the cassette connector cable from the CPU/Keyboard packing box.
- b. Connect the red plug to the Microphone jack on the side of the cassette recorder. This plug provides the signal from the CPU to the recorder.
- c. Connect the white plug to the Earphone jack on the cassette recorder. This plug provides the signal from the recorder to the CPU.
- d. Plug the black plug to the Remote jack. This allows the CPU to control the cassette recorder motor automatically.
- e. Connect the other end of the cable to the "CASSETTE" jack on the back of the CPU. **BE SURE THAT YOU DO NOT CONNECT IT TO THE "COLOR" JACK BY MISTAKE, SINCE THIS COULD HARM YOUR CPU/KEYBOARD.**

BE SURE THAT THE CASSETTE YOU PURCHASE HAS THE CONNECTIONS ON IT DESCRIBED ABOVE.

## NOTES

### CASSETTE PLUG COLOR MEANINGS

REM = BLACK

MIC = RED

EAR = WHITE



## APPENDIX A

### NOTES ON CARE, MAINTENANCE AND SERVICE POLICY

#### Cleaning:

The unit exteriors may be cleaned with a soft cloth dampened with water or with a mild cleaner designed for cleaning enamel surfaces. Before you clean, turn the units OFF and unplug them. Wipe the cabinets dry if you use a damp cloth. When you clean the display screen, spray a cleaning substance onto a cloth and then wipe; do not spray the screen itself.

Be sure that any cleaning substances do not contain benzine, paint thinner or any volatile substances. These may cause discoloration and other damage. Insecticides and other strong chemicals may also be harmful to computer equipment.

#### If Your Equipment Gets Wet:

Disconnect the plug and consult your local TOSHIBA dealer.

#### Keep Foreign Objects Away:

If a metal object (such as a hair pin or paper clip) or an inflammable object (such as paper) gets into the equipment, it may cause fire, electric shock or equipment malfunction.

#### Do Not Remove The Rear Cover:

Always consult your TOSHIBA dealer for internal inspection or adjustment.

#### Care Of The Power Cords:

A broken power cord or a power cord with its inner wires exposed may burn or cause fire or electric shock. If the power cord is damaged, consult your TOSHIBA dealer for replacement.

Transportation:

If you need to move your equipment to a new location or take it in for service, use extreme care. A strong impact may cause serious damage. Before moving the units, disconnect the plugs from the power outlets and disconnect all the cables. Be sure you wrap the units in their original packing, with the styrofoam guards in place.

If the floppy disk drive unit needs to be transported, make sure you place the cardboard floppy disks into the disk drives to protect the magnetic heads.

## APPENDIX C

**T-BASIC AND T-DISK BASIC  
CONTROL CHARACTER TABLE**

- o Control characters are special characters used for control of the computer and its components when entering a program. The control characters may be input by the special keys on the keyboard, or by a combination of the CTRL key and another key.
- o To enter a control character, simultaneously push the CTRL key and an appropriate alpha-character key (shown below).
- o Each control character has a corresponding internal computer code.

Character Code	Key Combinations	Functions
13	CTRL/M	Carriage return and line feed.
10	CTRL/J	Line feed.
7	CTRL/G	Sound speaker.
11	CTRL/K	Moves the cursor to home (upper left corner).
6	CTRL/F	Moves the cursor right to the first alphanumeric character following a special character or space.
2	CTRL/B	Moves the cursor left as for CTRL/F.
18	CTRL/R	Inserts a space in front of the cursor position.
8	CTRL/H	Deletes a character to the left of the cursor position.
5	CTRL/E	Deletes from the cursor position to the end of the line.
12	CTRL/L	Clears the screen/cursor to home.

Character Code	Key Combinations	Functions
9	CTRL/I	Deletes text from tab stop to tab stop. Tabs are set every 8 spaces. The cursor automatically bounces under the 9th space.
3	CTRL/C	Terminates execution of the instructions or program.
19	CTRL/S	Stops program executions temporarily. Press any key (except BREAK) to restart the program.
15	CTRL/O	Turns screen output off; program or command continues. To turn it back on, press CTRL/O again.

## APPENDIX D

### USING TELECOMMUNICATIONS

Many exciting things are being done today with small computer telecommunications. You may "talk" with other computers across the room, or across the nation and send information back and forth. If you are interested in this feature, please contact your local TOSHIBA dealer.

The T100 contains an RS-232C interface. With the use of a communication cable available as an option from TOSHIBA and a modem, data transmission speeds of 75, 110, 150, 300 and 600 baud are available. The character length can be 5, 6, 7 or 8 bits.

## APPENDIX E

### HARDWARE SPECIFICATIONS

<u>EQUIPMENT</u>	<u>SPECIFICATIONS</u>
CPU	<ul style="list-style-type: none"><li>o Z-80A*</li><li>o Clock rate 3.99 MHz</li></ul>
ROM	<ul style="list-style-type: none"><li>o ROM T-BASIC, 32KB mask ROM (standard)</li><li>o 32KB ROM PACK (optional)</li><li>o 24KB ROM PACK (optional) (Parallel mount with 32KB ROM PACK is available)</li></ul>
RAM	<ul style="list-style-type: none"><li>o 64KB dynamic RAM (standard)</li><li>o CMOS RAM PACK 32KB (optional) Battery backup</li><li>o CMOS RAM PACK 16KB (optional) Battery backup</li></ul>
Keyboard	<ul style="list-style-type: none"><li>o 89 Keys</li></ul>
Cassette Interface	<ul style="list-style-type: none"><li>o 1600BPS</li><li>o Interface with cassette tape recorder with remote control function</li></ul>
RS232C Interface	<ul style="list-style-type: none"><li>o 600BPS</li><li>o RS232C converter is built in (standard) (can be connected to modem)</li></ul>
Printer Interface (CENTRONICS)	
Speaker	<ul style="list-style-type: none"><li>o Built in (standard)</li></ul>

\*Z-80A (TM) is a Trademark of Zilog, Incorporated

- |                     |  |
|---------------------|--|
| Power               | o AC 115V, 60Hz or 220/240V, 50Hz.   |
| Expansion Interface | o Built in   |
| Code                | o 8-bit ASCII; graphic characters  |
| Display Interface   | <ul style="list-style-type: none"><li>o 8 colors foreground and background colors may be specified</li><li>o Characters:<ul style="list-style-type: none"><li>- 80x25 or 36x24</li><li>- 8x8 dots per character</li><li>- Colors of characters can be specified.</li><li>- Display area is managed by addresses assigned sequentially.</li></ul></li><li>o Graphic Mode:<ul style="list-style-type: none"><li>- 160x100 dots or 72x96 dots</li><li>- Available to specify a color for each dot.</li><li>- Available to display characters with graphics.</li><li>- The colors of the characters can be specified by attribute characters.</li></ul></li><li>o Fine Graphic Mode<ul style="list-style-type: none"><li>- 640x200 dots or 288x192 dots</li><li>- Colors can be specified by each 8 horizontal dots.</li><li>- Available to display characters with graphics.</li><li>- The colors of the characters can be specified by attribute characters.</li></ul></li></ul> |

- Floppy Disk Drive
- o Can be connected directly to Unit T100 main body or with an expansion unit.
  - o Double-sided, double-density

Disk storage capacity:

Unformatted

Bytes per disk	437.5K bytes
Bytes per track	6.2K bytes

Formatted

Bytes per disk	285K bytes (approx)
Bytes per track	4096 bytes
Sector per track	16 sectors

External Expansion Unit

- o connect through external expansion unit interface of main body.

## APPENDIX F

### PART NUMBERS

<u>NAME</u>	<u>PART #</u>
Expansion Unit	PA7300
Fine Color Display	PA7161
5 1/4" Floppy Disk Drive	PA7200
Green Display	PA7150
Printer Cable, CENTRONICS Interface	PA7423
RAM PACK 16	PA7242
RAM PACK 32	PA7244
ROM PACK	PA7540
RS-232C Cable	PA7426
TOSHIBA T100 Personal Computer	PA7010
Owner's Manual	PAD8210-1
Programmer's Reference Manual	PAD8211-1

## NOTES

## **GLOSSARY**

## GLOSSARY

### B

BASIC	Beginner's All-purpose Symbolic Instruction Code is a high-level language which translates ordinary language statements to machine language via an interpreter.
BREAK key	Pressing the BREAK key causes the program to stop while it is running. The terminal interaction is stopped when the SHIFT key and the BREAK key are pressed together.
byte	A unit of storage; a group of bits (which are the smallest unit of information; binary 0 or 1) usually 8 in number plus 1 parity bit, that form a subunit of information.

### C

CAPS LOCK key	A key that when pressed causes letters to appear on the display screen in upper case until the key is pressed a second time. At this point the characters are returned to their lower case form.
cassette	A piece of equipment that may be used to store programs or files via a cassette recorder; <u>see</u> Appendix B.

central processing unit	<u>see</u> CPU.
character	A numerical, alphabetical or special symbol, such as (,*,#,\$,).
CLS key	A key that when pressed along with the SHIFT key moves the cursor to the "home" position (the first character position at the top of the screen) after erasing the screen.
color display	<u>See</u> display.
CPU	Central Processing Unit; executes instructions and houses internal memory.
command	A single instruction given to the computer which produces an immediate pre-programmed response. RUN, LOAD, and LIST are examples of command statements.
computer	A machine that processes binary symbols in customized programmed sets to produce desired application results for users. A personal computer is a computer used for business or professional applications in an office environment or at home.
CTRL (CONTROL) key	A key that when pressed simultaneously with other keys alters the normal function of the simultaneously pressed key. Example: pressing CTRL and R inserts a space in front of the cursor position; <u>see</u> Appendix C.

copy drive	<u>See</u> drive, copy.
COPY key	A key that when pressed causes information appearing on the screen display to be printed by the printer.
CP/M	A special operating system for microcomputers produced by Digital Research, Inc. CP/M is compatible with the T-100.
CRT	<u>See</u> display.
cursor	A flashing underscore that marks your position on the display screen. The cursor may be moved by the arrow-keys in the 10-key pad.

## D

data	Sets of characters, such as input, which are processed by programs to generate the desired application result.
data keys	Keys on your computer keyboard most of which correspond to the keys appearing on a standard typewriter.
deleting	A method of correcting a typographical error by eradicating an unwanted character; <u>see</u> DEL key.
DEL key	A key that when pressed causes the character preceding the cursor to be deleted.

display	(video display unit, VDU); television-like cathode ray tube, CRT). Screen or monitor that shows typed commands, prompts, programs that you input into the computer or the computer outputs to you.
drive, copy	The floppy disk drive that holds the floppy disk you want to copy information to during the disk copying procedure.
drive, origin	The floppy disk drive that holds the original floppy disk you want to copy from during the disk copying procedure.

## E

erase	To remove information from the display screen and/or the computer memory.
ESC (ESCAPE) key	A key that when pressed allows you to "escape" from the line you are typing so you can begin again on a new line. This key enables you to escape when your program is in an infinite loop.

## F

file	A program or set of predetermined formatted records stored on a disk.
floppy disk drive	A unit of equipment that holds the

	floppy disk and allows information to be stored and/or read.
floppy disks	Magnetic disks; thin flexible disks which store data and programs externally from the computer.
formatting (initializing)	The process that prepares the disk so that it can store information properly.
function key	Pre-programmed keys that when pressed tell the computer to perform a specific function.

## G

GRAPH key	A key that when pressed simultaneously with a letter or numeric key displays a graphic symbol on the screen.
-----------	--

## H

HOME key	A key that when pressed moves the cursor to the "home" position—the first character position at the top of the screen.
----------	--

## I

initializing	<u>See</u> formatting.
input	Data entered to be processed by a program.

inserting	A method of correcting typographical errors by adding a letter where one has been omitted; <u>see</u> INS key.
INS key	A key that when pressed places a space to the left of the cursor.
instruction	A command, such as RUN, LIST, GOTO which causes the computer to perform the operation specified.

## K

keyboard	The typewriter-like portion located on the front of the CPU, including data keys, function keys, program function keys and a 10-key numeric pad.
----------	--

## L

LABEL key	A key that displays on the 25th line of the screen the functions assigned to the program function keys.
language, computer	A set of instructions used to communicate with the computer to make the machine perform the steps necessary to produce the desired result.
line editing keys	Keys used to enter, send, correct or repeat data. CTRL, INS, and DEL are examples of line editing keys.

line numbers

Identifying numbers that give sequence to the program and identify statements. The line numbers indicate to the computer that a program is being entered.

LIST

A command statement that causes a program to be printed out on the screen.

## M

memory

High speed area for storing information within the computer, so that it can be accessed by the CPU.

monochrome display

See display.

## O

operating system

The computer's "manager" that controls the running of the computer and regulates the sequence of activities.

origin drive

See drive, origin.

overstriking

A method of correcting typographical errors by typing over the incorrect characters.

## P

print

An auxiliary unit which prints a

paper copy of the information appearing on the display screen or stored elsewhere.

program A custom set of instructions, written in a defined language, to perform a desired result on the computer.

program function key A key that when pressed causes a series of user-programmed instructions to be executed to perform a specific function.

prompt A cue given by the program and printed out on the display, requesting a response from you.

## R

RAM Random Access Memory; internal memory or storage which can be directly accessed by the CPU without an extensive sequential search and the only place to which the CPU has access to process information.

random access memory See RAM.

read only memory See ROM.

return key A key that when pressed returns the cursor to the first place on the next line.

ROM                    Read Only Memory; preprogrammed set of instructions which can be directly accessed by the CPU without having to transfer it to regular memory.

RUN                    Command statement which executes a program.

S

space bar            Moves the cursor to the right one space.

SHIFT key            A key that when pressed causes upper case letters or the upper character on the key to be typed.

storage              A place where data files or program sets are kept. Storage can be internal and permanent as in the ROM pack; internal and non-permanent as in the RAM pack; or external and permanent/ non-permanent as on floppy disks.

System Disk          A disk that contains pre-programmed instruction sets that enable the computer to execute commands.

T

TAB key             Moves the cursor to the next tab setting. Tabs are preset for every 8 character spaces on a line or may be programmed for any character space.

T-BASIC	Toshiba BASIC; the interpretive computer language stored in the ROM PACK of your T-100.
T-DISK BASIC	Toshiba Disk BASIC; the interpretive computer language which is stored on an external floppy disk and may be utilized by the T-100.
telecommunication	The linking of computers so that files may be sent across the room or across the nation.
(ten) 10-key pad	A standard calculator pad which facilitates the entering of numbers.
terminal mode	Interaction between the keyboard and the CPU.
video display unit	<u>See</u> display.
VOLCOPY	Name for program used to make copies of disks.

W

write

The process of transferring information from internal memory to an external floppy disk, either for storage or to allow the internal memory to be used for other information.

write-  
protecting

The process of making the disk "read only" so that you can not write on it. This is accomplished by placing a small piece of silver paper on the "write-protection" slot of the disk.



**INDEX**



**5-1/4 INCH FLOPPY DISK  
DRIVE UNIT OWNER'S GUIDE**

**(PA7200U)**

**TOSHIBA**

PAD8142-1

This guide gives general information regarding installation, operation and connection of the 5½ Inch Floppy Disk Drive Unit.

### **IMPORTANT NOTICE**

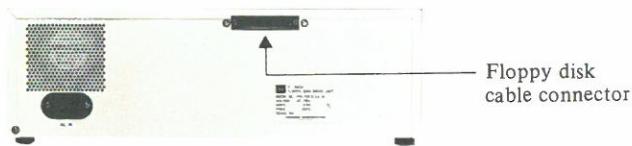
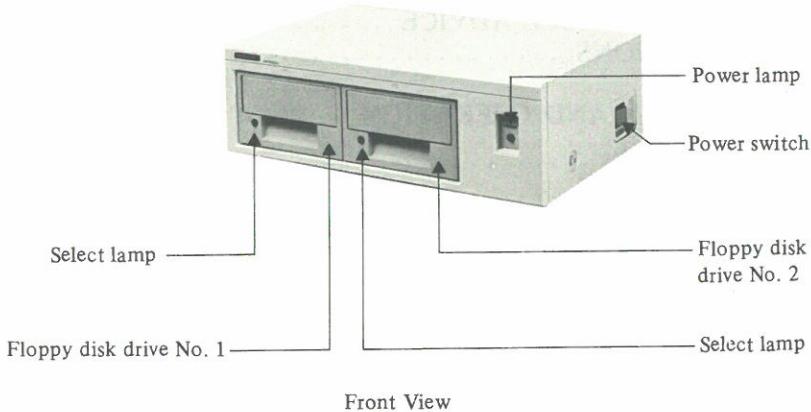
- All rights reserved. This guide is protected by copyright. No part of this guide may be reproduced in any form whatever without the written permission of the copyright owner.
- The contents of this guide are subject to change, from time to time, without notice.
- All efforts have been made to ensure that the contents of this guide are correct; however, should any errors be detected, TOSHIBA would greatly appreciate being informed.
- TOSHIBA can assume no responsibility for errors in this guide or the consequences thereof.

## TABLE OF CONTENTS

	Page
FLOPPY DISK DRIVE UNIT	
COMPONENTS .....	1
ACCESSORIES .....	2
CARE AND SERVICE ADVICE .....	3
SPECIFICATIONS .....	5
CONNECTION AND OPERATION	
CONNECTION .....	7
OPERATION .....	8
FLOPPY DISKS	
FLOPPY DISK .....	9
RECORD FORMAT .....	10
FORMATING AND PROTECTION .....	11
FLOPPY DISK HANDLING .....	12

# FLOPPY DISK DRIVE UNIT

## COMPONENTS



## ACCESSORIES

The following accessories are included with your 5-1/4 inch Floppy Disk Drive Unit:

- \* Owner's Guide
- \* AC Power Cord
- \* Connection Cable

## **CARE AND SERVICE ADVICE**

This floppy disk drive unit utilizes an AC 115V (60Hz) power source.

When pulling out the power cord, grasp the power plug, not the cord.

Don't turn on and off quickly. Wait more than five seconds between on-off operation.

### **Storage And Usage Environment**

- This machine should be located in an area with a stable operating environment. Avoid using or storing the equipment in an area subject to severe humidity or temperature changes.
- The equipment should not be placed in the direct rays of the sun or near a heat source.
- This equipment should be stored or used in a clean, dry area. Avoid using or storing it in a dusty, damp location.
- The Floppy Disk Drive unit is made of precision electronic parts and violent shocks or vibration while in use or storage should be avoided.
- Care should be taken to keep liquids away from the machine.
- Chemicals should not come in contact with this machine or used in the air around it.
- Do not use or store the machine partially dismantled. This could cause an accident or electrical shock.
- Do not pile or stack things on top of the machine.
- The Floppy Disk Drive unit should be kept separate from radios and televisions. Use of this equipment near a radio or television may cause interference in reception, and correspondingly, the strong magnetic field produced by radio and television may adversely effect the machine.

## Maintenance

- The cabinet may be cleaned with a soft cloth dampened with water or with a mild cleaner. When benzine, paint thinner, insecticides, volatile chemicals or any volatile substance come into contact with the cabinet, there is risk of discoloration and damage to the finish. The same risk applies with the use of insecticides.

## Malfunctions

- If the machine gives off a strange odor or overheats, pull the power plug immediately and consult your Toshiba dealer.

## Transportation

- Keep the protective sheets which were inserted in the floppy disk drives at shipment. These sheets provide protection for the magnetic heads and should be reinserted whenever the unit is transported.

## **SPECIFICATIONS**

The 5-1/4 inch Floppy Disk Drive Unit houses a control board, two floppy disk drives and a power supply unit.

### **Dimensions**

Height	5.5 inches (140 mm)
Width	16.5 inches (420 mm)
Depth	10.6 inches (270 mm)
Weight	19.8 lbs (9 Kg)

### **Performance**

This Floppy Disk Drive unit uses double-sided, double-density 5-1/4 inch disks.

#### **Storage Capacity**

##### **Unformatted**

Bytes per disk	437.5K bytes
Bytes per track	6.2K bytes

##### **Formatted**

Bytes per disk	280K bytes
Bytes per track	4096 bytes
Sector per track	16 sectors

#### **Data Transfer Rate**

250K bits/sec
31.25K bytes/sec
(approx 32 micro secs/ byte)

#### **Access Time**

Seek time	25 ms
-----------	-------

(track-to-track)

Average	298 ms
---------	--------

(including the  
settling time)

Settling time	15 ms
---------------	-------

#### **Head load time**

Average latency time	50 ms
	100 ms

#### **Drive motor start time**

1.4 sec

### **Functional Specifications**

Disk rotation speed	300 RPM
---------------------	---------

Recording density	5456 BPI
-------------------	----------

Track density	48 TPI
---------------	--------

Number of tracks	70
Track radius (innermost track) (outermost track)	39.16 mm 57.15 mm
Number of index	1
Recording method	MFM
Recording media size	5.25 inches

### Power Supply

115V AC (60 Hz) + 10%, -15%  
0.9 AMPS maximum

### Environment

#### Temperature

Operating	5°C to 35°C
Non-operating and storage	-15°C to 47°C

#### Relative Humidity (non-condensing)

Operating	20% to 80%
Non-operating	10% to 90%

### Glossary

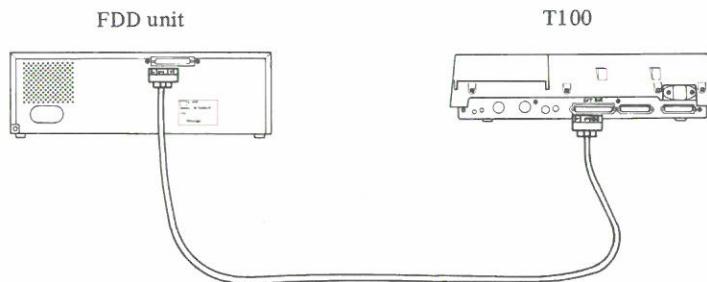
Track	The concentric recording area on the disk. A 5-1/4" disk has 35 tracks on each side.
Sector	A division of recording area within each track. Each track consists of 16 sectors.
Transfer Data Rate	The speed with which data is transferred between the T100 central processing unit (CPU) and this Floppy Disk Drive (FDD) Unit.
Access Time	The time lapse from command issuance till the read/write operation is effected.
Seek Time	The time that it takes the read/write magnetic head to move from track to track.
Settling Time	The time lapse from the seek operation till read/write occurs.
Motor Start Time	The time it takes the motor to come to speed.

# CONNECTION AND OPERATION

## CONNECTION

- T100 + Floppy Disk Drive Unit

Connect with the cable included with FDD unit.



## OPERATION

### 1. Power

Connect the AC power cord and turn on the FDD Unit *before* turning on the T100 Central Processing Unit (CPU).

### 2. Floppy Disks

To insert a disk:

Open the Floppy Disk Drive door by raising the lower edge of the drive door.

Place the disk in the drive with the label facing up (note the instructions on the disk label). Be sure the disk is all the way in the drive. You will hear a sound telling you the disk is properly inserted.

Close the drive door.

To remove a disk:

Confirm that the busy indicator lamp on the Floppy Disk Drive is off. Never remove a disk when the light is on..

Open the drive door.

Remove the floppy disk and place it in the protective paper envelope.

Close the door.

### 3. Power Off

Be sure the busy indicator lamp on the Floppy Disk Drive is off.

Remove the floppy disk and place it in the protective envelope.

Turn the power off.

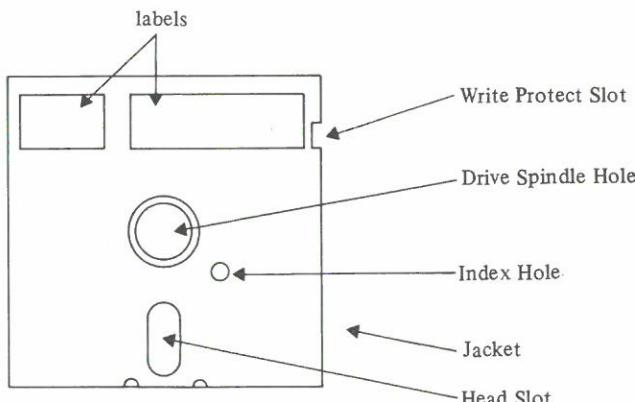
# FLOPPY DISKS

## FLOPPY DISK

Floppy disks provide you with a large amount of magnetic storage. They are thin, flexible disks permanently enclosed in semi-rigid plastic jackets.

The disk itself is round and rotates freely within the jacket when inserted in the disk drive.

When not in use, floppy disks are stored in the protective paper envelopes.



### Labels

A disk may have two labels. One label indicates the proper way to insert the disk and gives information on the storage capacity. Another label may be used to indicate the contents of the disk.

### Write Protect Slot

If this slot is covered, no data can be stored. Covering this slot protects the software from possible damage.

### Drive Spindle Hole

The disk drive rotates the disk by clamping this hole.

### Index Hole

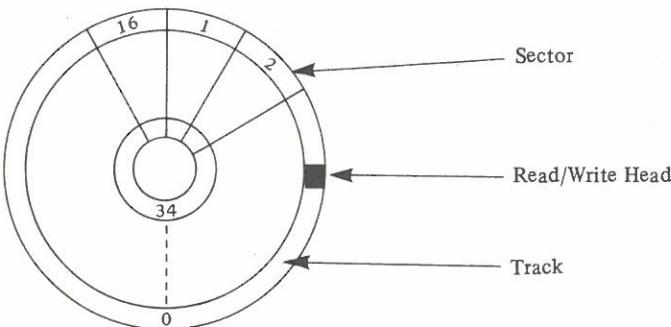
This hole indicates the first sector location.

### Head Slot

The read/write head of the disk drive accesses the disk through this slot.

## RECORD FORMAT

The record format of a floppy disk is illustrated below.



Track

Information is recorded along concentric circles on the disc, called tracks. A 5-1/4 inch double sided floppy disk has 35 tracks on each side for a total of 70 tracks. Each track is numbered 0 through 34 on each side.

Sector

Each track is logically divided into sectors. Each track is divided into 16 sectors of equal size. Each sector in a track is numbered 1 through 16.

Read/Write Head

On a double sided floppy disk, the read/write head accesses the disk on both sides. The read/write head moves in and out across the disk.

## FORMATTING AND PROTECTION

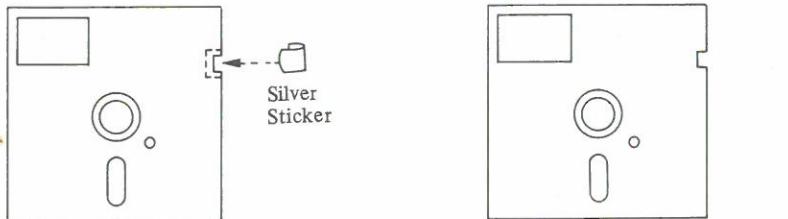
### 1. Formatting

A new floppy disk must be formatted before it can be used. Select the formatting or initialization utility program appropriate to the software system you are using.

### 2. Write Protection

Write-protecting a floppy disk means placing the disk in read-only status. The magnetic head will read the contents of the disk but cannot write on it, thus protecting the contents from being accidentally charged or destroyed.

Silver stickers are enclosed with the floppy disk. By placing one over the write-protect slot, the disk will be in read-only status.



To write-protect, fold the silver sticker and apply it over the read/write slot.

To make disk writable, remove the silver sticker.

If you have disks which contain important information, it is recommended that you make back-up copies.

## FLOPPY DISK HANDLING

- Do not touch or attempt to clean the data recording surface of the floppy disk.
- When not in use, floppy disks should be stored in their protective paper envelopes.
- Floppy disks may be damaged if twisted, bent, dropped, exposed to sunshine, extreme cold, food, liquid, beverages, dust, or smoke.
- Write descriptive information on labels before applying them to a floppy disk. Never write on a label already affixed to a disk.
- Do not use an eraser on a floppy disk label or near a floppy disk.
- Floppy disks should not be placed near magnets or magnetized objects, like paper clip holders or audio speakers.
- Rubber bands or paper clips should not be used on floppy disks. Floppy disks should be stored in an upright position, not stacked. Heavy objects should not be placed on floppy disks.

( )

( )

( )

**FINE COLOR DISPLAY  
OWNER'S GUIDE**

**(PA7161U)**

**TOSHIBA**

PAD8141-1

This guide gives general information regarding installation, operation and connection of the Fine Color Display.

## IMPORTANT NOTICE

- All rights reserved. This guide is protected by copyright. No part of this guide may be reproduced in any form whatever without the written permission of the copyright owner.
- The contents of this guide are subject to change, from time to time, without notice.
- All efforts have been made to ensure that the contents of this guide are correct; however, should any errors be detected, TOSHIBA would greatly appreciate being informed.
- TOSHIBA can assume no responsibility for errors in this guide or the consequences thereof.

## TABLE OF CONTENTS

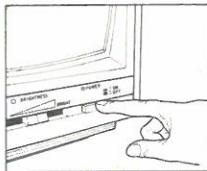
	Page
LOCATION OF CONTROLS AND HOW TO USE THEM .....	1
TILT/SWIVEL MECHANISM .....	3
HOW TO CONNECT YOUR DISPLAY WITH EXTERNAL EQUIPMENT .....	4
SIGNAL INPUT TERMINALS .....	5
HOW TO USE FINE COLOR DISPLAY	
PROPER LOCATION .....	6
BASIC RULES TO OBSERVE .....	7
PRECAUTIONS .....	9
HAZARDOUS CONDITIONS .....	11
SPECIFICATIONS .....	12

# LOCATION OF CONTROLS AND HOW TO USE THEM

[Front Panel]



## 1 POWER SWITCH

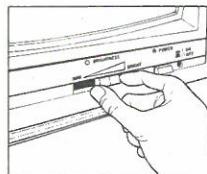


Depress the (—|ON) switch to turn the power ON.

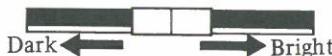
When the unit is ON, the indicator lamp will light.

Depress this switch again (—○ OFF) to turn the Power OFF. The indicator lamp is not lighted when the unit is OFF.

## 2 BRIGHTNESS CONTROL



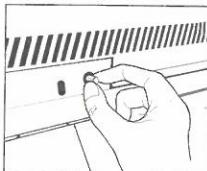
Slide this control to obtain the desired level of screen brightness. To lessen eye fatigue, a medium setting is desirable.



[Rear Panel]



**3 VERTICAL HOLD CONTROL**



Adjust this control by turning to the right or left to stop the picture from rolling up or down.

Roll up      Roll down



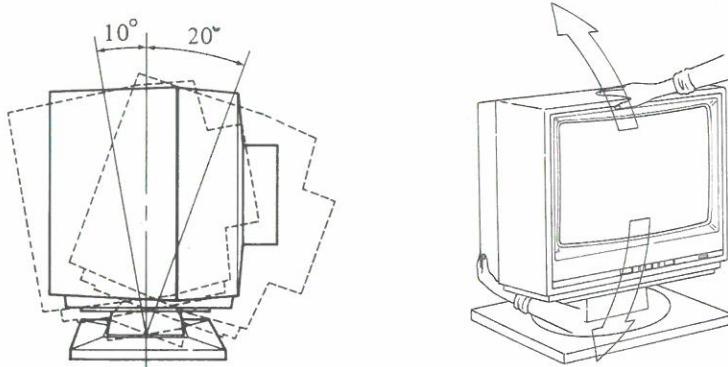
**4 VERTICAL AMPLITUDE AND FOCUS**

Consult your Toshiba service engineer if adjustment of vertical amplitude and focus is necessary.

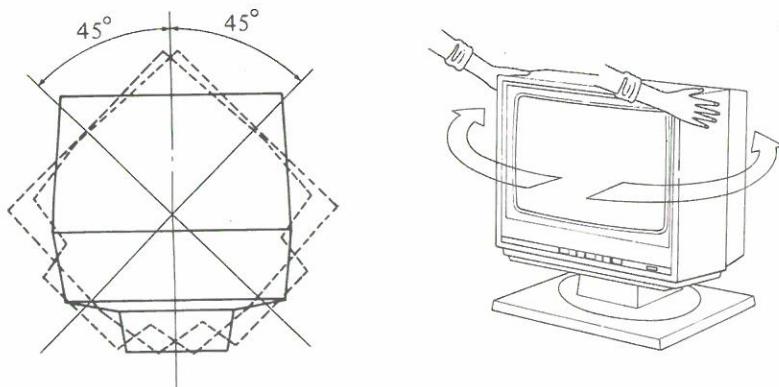
# TILT/SWIVEL MECHANISM

The unique tilt/swivel base of your Fine Color Display allows you to adjust it for your viewing convenience. Use both hands to adjust the display and apply firm, steady pressure.

## [TILT]

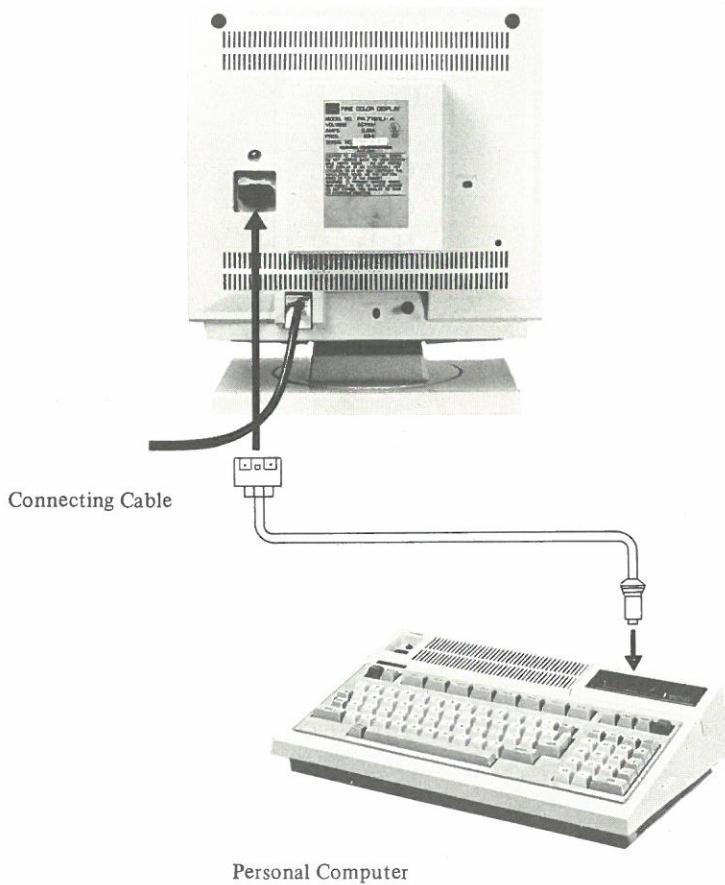


## [SWIVEL]



# HOW TO CONNECT YOUR DISPLAY WITH EXTERNAL EQUIPMENT

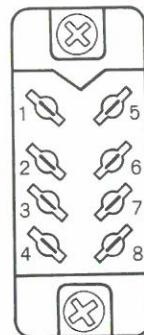
Before connecting your display with any external equipment, make sure all switches are OFF. It is best not to plug any equipment into a power supply until installation is complete.



# SIGNAL INPUT TERMINALS

The Type 1 8P connector is used for input signal connection to the Fine Color Display.

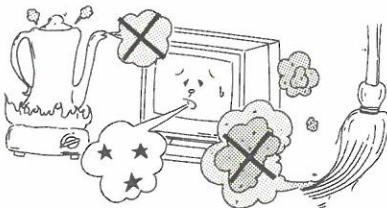
Pin No.	Signal Name
1	Open
2	Red
3	Green
4	Blue
5	GND
6	GND
7	H. D.
8	V. D.



# HOW TO USE FINE COLOR DISPLAY

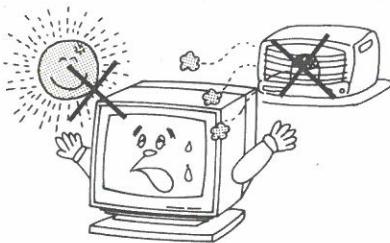
## PROPER LOCATION

- Select a clean, dry area for your display.



Excessive moisture or dust may create a fire hazard or cause interference.

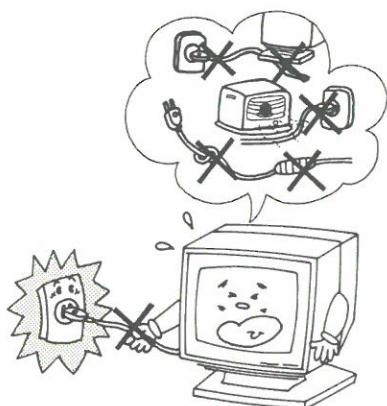
- Place your display in a cool area.



Locate the display OUT of direct sunlight and AWAY from a heat source to avoid cabinet damage or problems resulting from excessive heat.

## BASIC RULES TO OBSERVE

- Handle the power cord carefully.

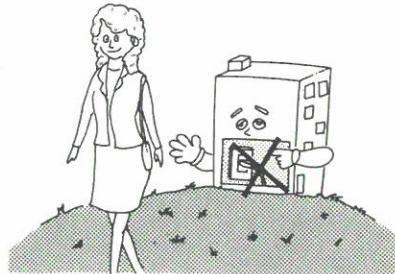


A broken power cord or a power cord with its inner wires exposed can cause fire, electric shock or burn. Observe the following:

- The cord and connecting cable should be freely movable, not placed under other equipment or furniture.
- Make sure the cord is not near a furnace or any other equipment that generates heat.
- When disconnecting the display, grasp the plug and pull it from the power outlet.  
Do not pull the cord itself.

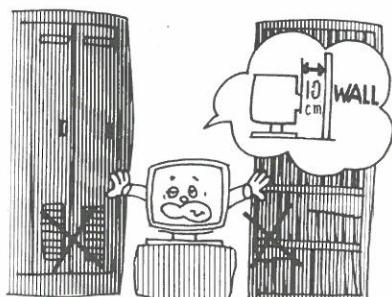
- If the power cord is damaged, consult your dealer for replacement.

- If you expect that your display will not be used for a long time:



Disconnect the plug from the power outlet.

- Locate your display in a well-ventilated area.

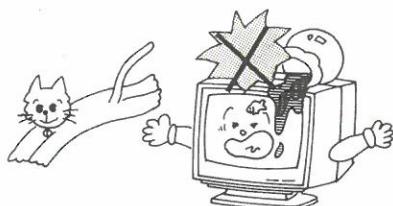


The display cabinet has ventilation holes to prevent the interior from overheating. Blocking these vents can cause problems.

Observe the following:

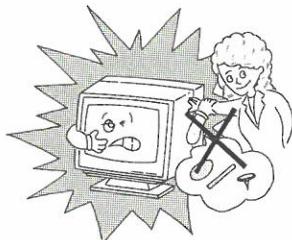
- Place the display at least 4 inches (10 cm) away from the wall.
- The display should be located in a well ventilated area.
- Place the display on a hard, clean surface, never on a carpet.

- Keep containers filled with liquid AWAY from your display.



If liquid should accidentally spill into the cabinet, disconnect the plug and consult your dealer. Using a display that has became wet can cause fire, electric shock or equipment damage.

- Keep foreign objects out of your display.



If a metal object (hair pin, paper clip, etc.) or an inflammable object (paper, etc.) gets into the cabinet, it may cause fire, electric shock or equipment malfunction.

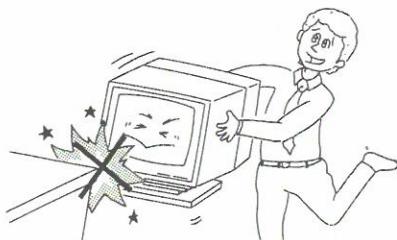
- The rear cover should not be removed.



Always consult your dealer for internal inspection or adjustment.

## PRECAUTIONS

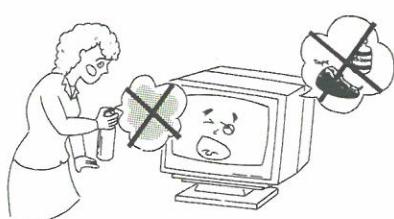
- Use extreme care when transporting your display.



A strong impact may cause serious damage.

- Before moving the display, disconnect the plug from the power outlet disconnect from other equipment.

- Using harsh cleaning solvents or abrasive cleaners will damage the cabinet.



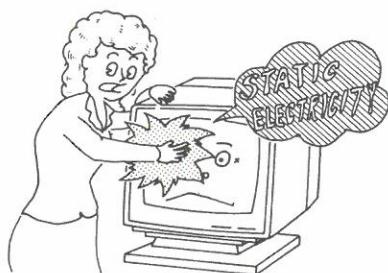
- Use a mild cleaning solution of soap and water or a product you would use to clean an enamel surface.
- Affixing cellophane tape or other adhesive materials to the cabinet may cause damage.
- Rubber or vinyl products that have prolonged contact with the surface may cause damage to the cabinet.

- Cleaning the cabinet.



The display should be OFF. To clean the cabinet, use a dry, soft cloth. If the cabinet is very dirty, dampen a cloth with a mild cleaning solution (soap and water), and then wipe with a dry cloth.

- Static electricity.



You may feel mild electricity when your hand touches the screen (CRT). This is normal.

- Cleaning the CRT.



The surface of the CRT will collect dirt and dust like your TV screen. The display should be OFF. Spray a mild cleaner lightly on a soft, clean cloth and wipe the screen. Use of an abrasive cleaner or harsh chemical solvent may damage the CRT screen.

## HAZARDOUS CONDITIONS

- Unusual odor, sound or smoke.



If an unusual odor, sound or smoke occurs, disconnect the plug from the power outlet immediately. Check the display for any obvious problems, and consult your dealer if the problem recurs.

## NOTES

IBM - T100 Tech. spec. NOTICE

REFERENCE TO RGB MONITOR OF T100 TO HOOK ON IBM COLOUR GRAPHICS ADAPTER.

Fig. 1: PIN CONNECTING COMPARISON

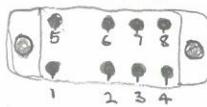
T100	
Pin No	SIGNAL NAME
1	OPEN (composite sync)
2	RED
3	GREEN
4	BLUE
5	GND. (ground)
6	GND
7	H.D - (horizontal drive)
8	V.D - (vertical drive)

IBM PC	
Pin No.	SIGNAL NAME
1	-
2	-
3	-
4	-
5	-
6	-
7	-
8	-
9	-

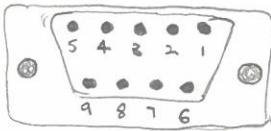
subheading: PLUG COMPARISON

T100 plug interface

= DIN INTERFACE



IBM PC plug interface



Footnote

INTENSITY is used to specify a degree of increased brightness on the screen so to make the desired colour seem lighter  
example: Blue - light blue  
darkgreen - lightgreen

ext

CONVERSION

T100 PIN NO.	IBM PIN NO.
①	RESERVED
②	GND
③	GREEN
④	BLUE
⑤	GND
⑥	GND
⑦	H.D
⑧	V.D



# SPECIFICATIONS

CRT	: 14'', 90° deflection high-resolution color CRT
Input signals	: Video (R, G, B) TTL level (positive) Horizontal drive (H.D.) TTL level (negative) Vertical drive (V.D.) TTL level (negative)
Scanning frequency	: Horizontal : 15.75 KHz Vertical : 60 Hz
Display time	: Horizontal : 44.70 $\mu$ s Vertical : 12.74 ms
Display area	: 9.6 inches (H) x 7.1 inches (V) (245 mm (H) x 180 mm (V))
Resolution	: Horizontal : 640 dots Vertical : 200 lines
Display colors	: 8 colors (red, blue, green, yellow, light blue, purple, white, black)
Display format	: 2,000 characters max. (80 characters x 25 lines)
Power input	: AC 115V, 60 Hz
Power consumption	: 65 W
Tilt/Swivel Angle	: Forward tilt : 10° Backward tilt : 20° Swivel : 45° both aways
Dimensions	
Height	: 16.6 inches (422 mm)
Width	: 14.4 inches (366 mm)
Depth	: 15.0 inches (380 mm)
Waight	: 26.5 lbs (12 Kg)



## INDEX

arrow keys, 2-43, 2-48, 2-49  
BREAK key, 2-45  
BASIC, 4-3  
baud, A-11  
CAPS LOCK key, 2-21, 2-39, 2-41  
cassette, A-8, A-12  
central processing unit, see CPU  
CENTRONICS interface, i, 1-17, A-12  
cleaning, 3-13, A-1  
CLS/HOME key, 2-43  
code, A-12  
control characters, A-9  
COPY key, 2-45  
copying disks, see disks  
correcting typing mistakes, 2-49  
CP/M, i, ii, 2-5, 2-27, 2-28, 2-34, 2-36  
CPU/Keyboard, 2-5  
    features, i  
    install, 1-9  
    power off, 2-57  
    power on, 2-15  
    specifications, A-12  
CRT, see display  
CTRL key, 2-41  
cursor, 2-21  
data keys, 2-39  
DEL key, 2-41, 2-48, 2-49  
deleting, 2-48, 2-49  
disk drive unit, see floppy disk drive unit  
disk storage  
    features, i  
    specifications, A-14  
disks, 2-5  
    care, 2-7, 2-55  
    copying  
        CP/M, 2-36  
        T-DISK BASIC, 2-31

formatting  
    CP/M, 2-39  
    T-DISK BASIC, 2-28  
inserting, 2-9, 2-13  
labeling, 2-55  
removing, 2-53  
write-protecting, 2-27, 2-28  
display, 2-5  
    Brightness, 2-21  
    Focus, 2-21  
    Height, 2-21  
    install, 1-11  
    power off, 2-57  
    power on, 2-11  
    specifications, A-12  
    tilt/swivel, 2-23  
    V. Hold, 2-21  
environmental requirements, 1-5  
ESC key, 2-45  
expansion interface, A-12  
external expansion interface, A-13  
FDD, see floppy disk drive unit  
fine color display, 1-11  
    features, i  
    also see display  
floppy disk drive unit, 2-5  
    install, 1-13  
    power off, 2-57  
    power on, 2-9, 2-13  
    specifications, A-14  
    transportation, A-2  
formatting  
    see disks  
function keys, see programmable function keys  
green display, see monochrome display  
GRAPH key, 2-45  
graphics, 2-45  
INS key, 2-43, 2-50, 2-51  
inserting, 2-50, 2-51

keyboard, 2-39, A-12  
    also see CPU/Keyboard

LABEL key, 2-45

line editing keys, 2-39, 2-41

maintenance, see service

modem, 1-2, 1-3, 1-19, A-11, A-12

monochrome display, 1-11

- Contrast, 2-21
- features, i

Termination Switch, 2-21

- also see display

numeric pad, 2-39

overstriking, 2-48, 2-49

part numbers, A-15

PF keys, see programmable function keys

power cables, 1-23, A-2

power guidelines, 1-23, A-12

power on, 2-9

printer, i, 2-6, 2-9, 2-57, A-12

- install, 1-17

program

- adding a line, 4-5
- changing a line, 4-4
- checking, 4-5
- executing, 4-6
- removing a line, 4-5
- running, 4-4
- samples, 4-7

programmable function keys, 2-29, 2-31, 2-39, 2-47

RAM, i, 2-5, A-12

RAM PACK, 2-6, A-12

- install, 1-21

RESET button, 2-15

Return key, 2-41, 2-49

ROM, i, 2-5, 2-15, 2-19, A-12

ROM PACK, i, 2-6, A-12

- install, 1-21

RS-232C interface, ii, A-11, A-12

- install, 1-19

screens, 2-17, 2-19, 2-21

service, A-1  
SHIFT key, 2-39, 2-41  
speaker, A-12  
special function keys, 2-39, 2-45  
specifications, 2-6, 2-15, 2-18, 2-19, A-12  
Tab key, 2-41  
T-BASIC, i, 2-6, 2-15, 2-18, 2-19, 4-3, 4-4, 4-7, A-9  
T-DISK BASIC, i, 2-5, 2-17, 2-27, 2-28, 2-31, 4-4, A-9  
telecommunications, A-11  
transporting the T100, A-2  
Trouble-Shooting, 3-3  
variables, 4-4  
write-protecting disks, see disks

## **PRODUCT COMMENT FORM**

Publication Title: \_\_\_\_\_

Publication No. \_\_\_\_\_ Revision \_\_\_\_\_ Date \_\_\_\_\_

Name \_\_\_\_\_

Address \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_

TOSHIBA welcomes your comments regarding any errors, discrepancies or omissions you may have discovered, or any suggestions for improving the manual in its next revision.

**TECHNICAL/CLERICAL ERRORS, OMISSIONS (SPECIFY PAGE NUMBER)**

---

---

---

---

---

---

---

---

---

---

---

## SUGGESTIONS





FOLD

---

AFFIX  
POSTAGE  
HERE

T100 Product Manager  
TOSHIBA AMERICA, INC.  
2441 Michelle Drive  
Tustin, CA 92680

1 - 714-730-5000  
PRINTER SECTION

---

FOLD